

# SO-SFP-MR50D-50G-Dxxxx

SFP, 100Mbps-2.7Gbps, Multirate, DWDM 50GHz, SM, DDM, 17dB, 50km

## OVERVIEW

The SO-SFP-MR50D-50G-Dxxxx series single mode transceiver is small form factor pluggable module for duplex optical data communications. This module is designed for single mode fiber and operates at a nominal DWDM wavelength from 1529.94nm to 1561.42nm as specified by the ITU-T. It is designed to deploy in the DWDM networking equipment in metropolitan access and core networks. It is with the SFP 20-pin connector to allow hot plug capability. The transmitter section uses a DWDM multiple quantum well DFB laser and is a class 1 laser compliant according to International Safety Standard IEC-60825. The SO-SFP-MR50D-50G-Dxxxx series are designed to be compliant with SFF-8472 Multi-Source Agreement (MSA).

## PRODUCT FEATURES

- Operating data rate up to 2.67Gbps
- Available in all C-Band and L-Band Wavelengths on the 100GHz DWDM ITU Grid
- Single 3.3V power supply and TTL logic interface
- Hot-Pluggable SFP footprint duplex LC connector interface
- Compliant with Class 1 FDA and IEC60825-1 laser safety
- Compliant with SFP MSA
- Compliant with SFF-8472
- Operating case temperature:
  - 0°C to 70°C standard
  - 5°C to 70°C extended

## APPLICATIONS

- Sonet / SDH
- Ethernet / Fibre Channel
- DWDM, SAN, WAN networking
- Equipment connectivity

## ORDERING INFORMATION

Part Number	Description
SO-SFP-MR50D-50G-Dxxxx	SFP, 100Mbps-2.7Gbps, Multirate, DWDM 50GHz, SM, DDM, 17dB, 50km
SO-SFP-MR50D-50G-Dxxxx-E	SFP, 100Mbps-2.7Gbps, Multirate, DWDM 50GHz, SM, DDM, 17dB, 50km. Ext.temp

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## ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min	Max	Unit
Storage Temperature	TS	-40	+85	°C
Supply Voltage	VCC	-0.5	3.6	V
Operating Relative Humidity			95	%

## RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Min	Typ	Max	Unit
Case Operating Temperature	$T_c$	SO-SFP-MR50D-50G-DXXXX		+70	°C
		SO-SFP-MR50D-50G-DXXXX -E	-5	+70	
Power Supply Voltage	Vcc	3.15	3.3	3.45	V
Power Supply Current	Icc			450	mA
Power dissipation	PW			1.5	W
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		

## PERFORMANCE SPECIFICATIONS – ELECTRICAL TRANSMITTER

Parameter	Symbol	Min	Typ	Max	Unit	Notes
CML Inputs(Differential)	$V_{IN}$	400		1600	mVpp	AC coupled inputs
Input Impedance (Differential)	$Z_{IN}$	85	100	115	ohms	$R_{in} > 100 \text{ kohms @ DC}$
TX Disable	Disable	2		Vcc	V	
	Enable	0		0.8		
TX FAULT	Fault	2		Vcc	V	
	Normal	0		0.8		

## PERFORMANCE SPECIFICATIONS – ELECTRICAL RECEIVER

Parameter	Symbol	Min	Typ	Max	Unit	Notes
CML Outputs (Differential)	Vout	400	800	1200	mVpp	AC coupled outputs
Output Impedance (Differential)	Zout	85	100	115	ohms	
Rx_LOS Output Voltage – High		2		Vcc	V	
Rx_LOS Output Voltage – Low		0		0.8	V	
MOD_DEF ( 2:0 )	VoH	2.5			V	With Serial ID
	VoL	0		0.8	V	

## PERFORMANCE SPECIFICATIONS – OPTICAL

Parameter	Symbol	Min	Typ	Max	Unit
Data Rate			2.5G		Gbps

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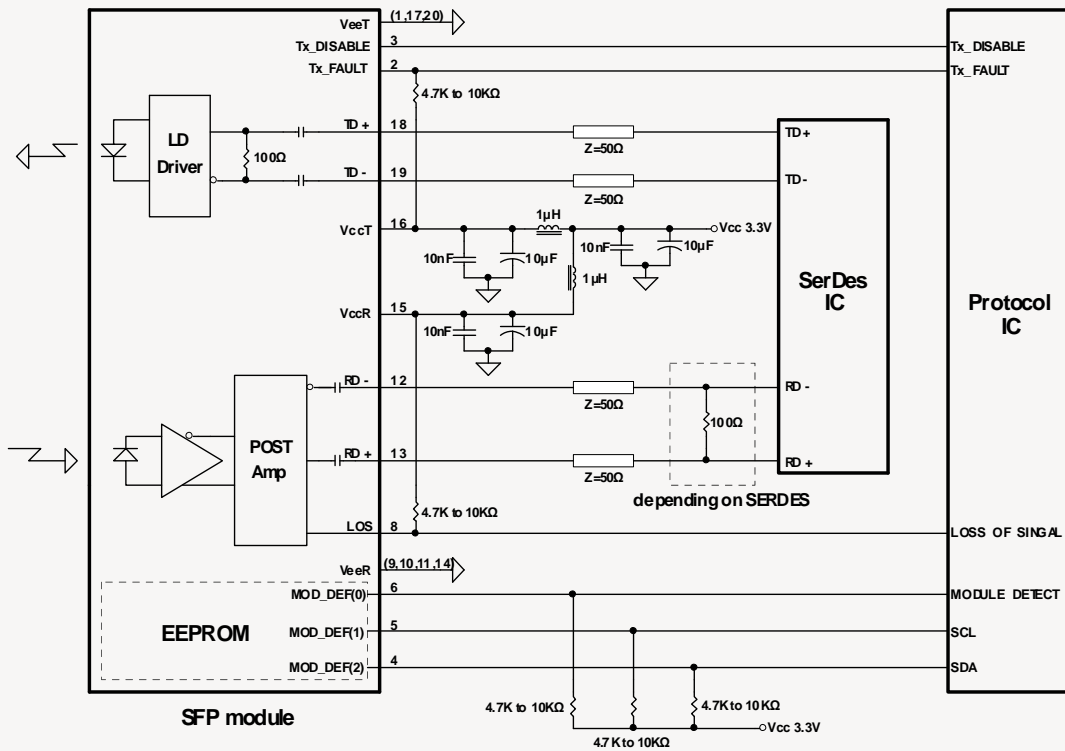
## PERFORMANCE SPECIFICATIONS – OPTICAL TRANSMITTER

Parameter	Symbol	Min	Typ	Max	Unit
Centre Wavelength	$\lambda_c$	1528		1564	nm
Spectral Width (RMS)	$\Delta\lambda$			0.3	nm
Side Mode Suppression Ratio	<i>SMSR</i>	30			dB
Channel Spacing	$\Delta f$		50		GHz
Deviation From Central Frequency@EOL		-6		6	Ghz
Average Output Power	<i>P<sub>out</sub></i>	0		5	dBm
Average Launch Power (Tx: OFF)	<i>P<sub>off</sub></i>			-45	dBm
Extinction Ratio	<i>ER</i>	8.2			dB
Rise/Fall Time(20%~80%)	<i>t<sub>r</sub>/t<sub>f</sub></i>			150	ps
Output Optical Eye		Compatible with IEEE 802.3			
TX Disable Assert Time	<i>t<sub>off</sub></i>			10	us
Pout@TX Disable Asserted	<i>P<sub>out</sub></i>			-45	dBm
Relative Intensity Noise	<i>RIN</i>			-135	dB/Hz

## PERFORMANCE SPECIFICATIONS – OPTICAL RECEIVER

Parameter	Symbol	Min	Typ	Max	Unit
Centre Wavelength	$\lambda$	1528		1620	nm
Receiver Sensitivity      Multirate	<i>P<sub>min</sub></i>			-17	dBm
Receiver Overload	<i>P<sub>max</sub></i>	-3			dBm
LOS De-Assert	<i>LOSD</i>			-19	dBm
LOS Assert	<i>LOSA</i>	-42			dBm
LOS Hysteresis		0.5			dB

RECOMMENDED CIRCUIT SCHEMATIC



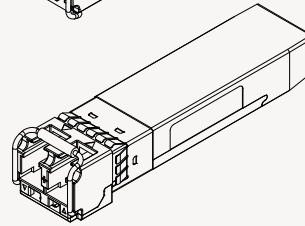
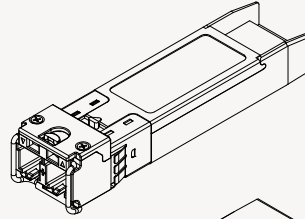
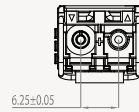
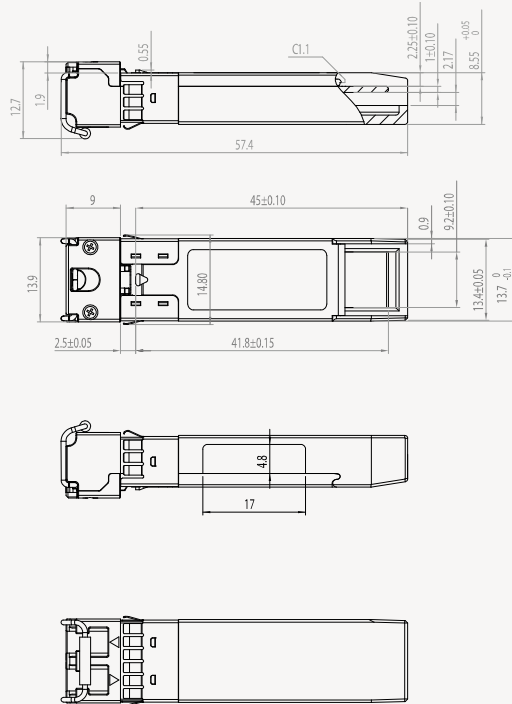
PIN ASSIGNMENT ACCORDING TO MSA

PIN	Signal Name	Description	PIN	Signal Name	Description
1	V <sub>EE</sub> T	Transmitter Signal Ground	11	V <sub>EE</sub> 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 <sub>EE</sub> R	Receiver Signal Ground
5	SDL	Modulation Definition 1 – Two wires serial ID Interface	15	V <sub>CC</sub> R	Receiver Power – 3.3V±5%
6	MOD-ABS	Modulation Definition 0 – Ground in Module	16	V <sub>CC</sub> T	Transmitter Power – 3.3V±5%
7	RS0	RX Rate Select (LVTTTL). This pin has an internal 30k pull-down to ground. A signal on this pin will not affect module performance.	17	V <sub>EE</sub> 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 pull-down to ground. A signal on this pin will not affect module performance.	19	TD-	Inverse Transmitter Data In
10	V <sub>EE</sub> R	Receiver Signal Ground	20	V <sub>EE</sub> T	Transmitter Signal Ground

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MECHANICAL DIMENSIONS



## EXTENDED ORDERING INFORMATION

Part Number	ITU channel no.	Frequency [THz]	Center Wavelength (nm)
SO-SFP-MR50D-50G-D9200	20.0	192.00	1561.42
SO-SFP-MR50D-50G-D9205	20.5	192.05	1561.01
SO-SFP-MR50D-50G-D9210	21.0	192.10	1560.61
SO-SFP-MR50D-50G-D9215	21.5	192.15	1560.20
SO-SFP-MR50D-50G-D9220	22.0	192.20	1559.79
SO-SFP-MR50D-50G-D9225	22.5	192.25	1559.39
SO-SFP-MR50D-50G-D9230	23.0	192.30	1558.98
SO-SFP-MR50D-50G-D9235	23.5	192.35	1558.58
SO-SFP-MR50D-50G-D9240	24.0	192.40	1558.17
SO-SFP-MR50D-50G-D9245	24.5	192.45	1557.77
SO-SFP-MR50D-50G-D9250	25.0	192.50	1557.36
SO-SFP-MR50D-50G-D9255	25.5	192.55	1556.96
SO-SFP-MR50D-50G-D9260	26.0	192.60	1556.55
SO-SFP-MR50D-50G-D9265	26.5	192.65	1556.15
SO-SFP-MR50D-50G-D9270	27.0	192.70	1555.75
SO-SFP-MR50D-50G-D9275	27.5	192.75	1555.34
SO-SFP-MR50D-50G-D9280	28.0	192.80	1554.94
SO-SFP-MR50D-50G-D9285	28.5	192.85	1554.54
SO-SFP-MR50D-50G-D9290	29.0	192.90	1554.13
SO-SFP-MR50D-50G-D9295	29.5	192.95	1553.73
SO-SFP-MR50D-50G-D9300	30.0	193.00	1553.33
SO-SFP-MR50D-50G-D9305	30.5	193.05	1552.93
SO-SFP-MR50D-50G-D9310	31.0	193.10	1552.52
SO-SFP-MR50D-50G-D9315	31.5	193.15	1552.12
SO-SFP-MR50D-50G-D9320	32.0	193.20	1551.72
SO-SFP-MR50D-50G-D9325	32.5	193.25	1551.32
SO-SFP-MR50D-50G-D9330	33.0	193.30	1550.92
SO-SFP-MR50D-50G-D9335	33.5	193.35	1550.52
SO-SFP-MR50D-50G-D9340	34.0	193.40	1550.12
SO-SFP-MR50D-50G-D9345	34.5	193.45	1549.72
SO-SFP-MR50D-50G-D9350	35.0	193.50	1549.32
SO-SFP-MR50D-50G-D9355	35.5	193.55	1548.91
SO-SFP-MR50D-50G-D9360	36.0	193.60	1548.51
SO-SFP-MR50D-50G-D9365	36.5	193.65	1548.11
SO-SFP-MR50D-50G-D9370	37.0	193.70	1547.72
SO-SFP-MR50D-50G-D9375	37.5	193.75	1547.32
SO-SFP-MR50D-50G-D9380	38.0	193.80	1546.92
SO-SFP-MR50D-50G-D9385	38.5	193.85	1546.52
SO-SFP-MR50D-50G-D9390	39.0	193.90	1546.12
SO-SFP-MR50D-50G-D9395	39.5	193.95	1545.72
SO-SFP-MR50D-50G-D9400	40.0	194.00	1545.32
SO-SFP-MR50D-50G-D9405	40.5	194.05	1544.92
SO-SFP-MR50D-50G-D9410	41.0	194.10	1544.53
SO-SFP-MR50D-50G-D9415	41.5	194.15	1544.13
SO-SFP-MR50D-50G-D9420	42.0	194.20	1543.73
SO-SFP-MR50D-50G-D9425	42.5	194.25	1543.33
SO-SFP-MR50D-50G-D9430	43.0	194.30	1542.94
SO-SFP-MR50D-50G-D9435	43.5	194.35	1542.54

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SO-SFP-MR50D-50G-D9440	44.0	194.40	1542.14
SO-SFP-MR50D-50G-D9445	44.5	194.45	1541.75
SO-SFP-MR50D-50G-D9450	45.0	194.50	1541.35
SO-SFP-MR50D-50G-D9455	45.5	194.55	1540.95
SO-SFP-MR50D-50G-D9460	46.0	194.60	1540.56
SO-SFP-MR50D-50G-D9465	46.5	194.65	1540.16
SO-SFP-MR50D-50G-D9470	47.0	194.70	1539.77
SO-SFP-MR50D-50G-D9475	47.5	194.75	1539.37
SO-SFP-MR50D-50G-D9480	48.0	194.80	1538.98
SO-SFP-MR50D-50G-D9485	48.5	194.85	1538.58
SO-SFP-MR50D-50G-D9490	49.0	194.90	1538.18
SO-SFP-MR50D-50G-D9495	49.5	194.95	1537.79
SO-SFP-MR50D-50G-D9500	50.0	195.00	1537.40
SO-SFP-MR50D-50G-D9505	50.5	195.05	1537.00
SO-SFP-MR50D-50G-D9510	51.0	195.10	1536.61
SO-SFP-MR50D-50G-D9515	51.5	195.15	1536.22
SO-SFP-MR50D-50G-D9520	52.0	195.20	1535.82
SO-SFP-MR50D-50G-D9525	52.5	195.25	1535.43
SO-SFP-MR50D-50G-D9530	53.0	195.30	1535.04
SO-SFP-MR50D-50G-D9535	53.5	195.35	1534.64
SO-SFP-MR50D-50G-D9540	54.0	195.40	1534.25
SO-SFP-MR50D-50G-D9545	54.5	195.45	1533.86
SO-SFP-MR50D-50G-D9550	55.0	195.50	1533.47
SO-SFP-MR50D-50G-D9555	55.5	195.55	1533.07
SO-SFP-MR50D-50G-D9560	56.0	195.60	1532.68
SO-SFP-MR50D-50G-D9565	56.5	195.65	1532.29
SO-SFP-MR50D-50G-D9570	57.0	195.70	1531.90
SO-SFP-MR50D-50G-D9575	57.5	195.75	1531.51
SO-SFP-MR50D-50G-D9580	58.0	195.80	1531.12
SO-SFP-MR50D-50G-D9585	58.5	195.85	1530.72
SO-SFP-MR50D-50G-D9590	59.0	195.90	1530.33
SO-SFP-MR50D-50G-D9595	59.5	195.95	1529.94