

SO-SFP-MR50D-Cxx

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

OVERVIEW

The SO-SFP-MR50D-Cxx fiber optical SFP+ (Small Form Pluggable) transceivers include a PIN diode and uncooled CWDM DFB transmitter. The modules operate at multiple data-rates up to 2.667 Gbps and supports protocols like, SONET OC-48/SDH STM-16/OC-12/OC-3, Gigabit Ethernet 1000BASE, Fibre Channel 1G/2G. The CWDM modules operate at nominal Coarse Wavelength Division Multiplexing (CWDM) wavelengths on the 20nm grid as defined in the ITU-T 694.2 standard. There are eighteen center wavelengths available from 1270nm to 1610nm, with each step 20nm. The module has a duplex LC optical interface and all mechanical characteristics are compliant with the current SFP+ specification (SFF-8431 and SFF-8432). All SFP modules fulfill the content of the serial EEPROM described in the SFP MSA, Appendix B4, table 3.1, at base data fields (defined as addresses 0 to 63) and extended data fields (defined as addresses 64 to 95). The nominal transmitter output wavelength is stated at the reserved addresses 60-61 according to SFF document SFF-8472 rev 10.4, "Digital Diagnostics Monitoring Interface". Wavelengths stated in the specification are measured in vacuum. All requirements in this specification are valid throughout the specified lifetime and operational environmental temperature range unless otherwise stated. The transceiver modules are compliant to RoHS-6/6.

PRODUCT FEATURES

- Operating data-rate up to 2.67 Gbps
- 18 CWDM wavelengths available from 1270nm - 1610nm
- Hot-pluggable SFP footprint with duplex LC connector
- Built-in digital diagnostic functions
- Up to 40km on 9/125um SMF (G.652)
- Single power supply 3.3V
- RoHS6 compliant
- Class 1 laser product complies with EN 60825-1
- Operating temperature range:
 - Standard 0°C to 70°C.
 - Extended -20°C to +85°C.
- Compliant with SFF-8472 (DDMI)

ORDERING INFORMATION

Part Number	Description
SO-SFP-MR50D-Cxx*	SFP, 100Mbps-2.7Gbps, Multirate, CWDM, SM, DDM, 17dB, 50km
SO-SFP-MR50D-Cxx-E*	SFP, 100Mbps-2.7Gbps, Multirate, CWDM, SM, DDM, 17dB, 50km, ext. temp

*xx = Refers to notation for frequency data. Please see extended order information on last page for additional information.

APPLICATIONS

- SDH / Sonet
- 2/1G Fibre Channel
- Gigabit Ethernet / Fast Ethernet
- CWDM, Optical networking and equipment connectivity

GENERAL SPECIFICATIONS

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Data Rate	DR	0.1		2.67	Gbps	
Bit Error Rate	BER			10^{-12}		
Operating Temperature	T_{OP}	0		70	°C	Case temperature
		-20		+85		Extended temperature
Operating Relative Humidity				95	%	
Storage Temperature	T_{STO}	-40		85	°C	Ambient temperature
Supply Current	I_S		200	300	mA	For electrical power interface
Input Voltage	V_{CC}	3.15	3.3	3.45	V	
Maximum Voltage	V_{MAX}	-0.5		3.6	V	For electrical power interface

OPTICAL CHARACTERISTICS – TRANSMITTER

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Output Optical Power	P_{TX}	-3		+2	dBm	Average, coupled into 9/125um SMF
Extinction ratio	E_r	8.2			dB	
Optical Center Wavelength	λ_C	According to ITU-T 694.2			nm	
Spectral Width (-20dB)	$\Delta\lambda$			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Rise/Fall Time	t_r/t_f			150	Ps	20% to 80%
Output Optical Eye	ANSI Fibre Channel and Gigabit Ethernet Compliant					
TX-DISABLE Assert Time	t_{off}			10	µsec	Average
Launch Power OFF	P_{off}			-45	dBm	Average

OPTICAL CHARACTERISTICS – RECEIVER

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Optical Receiver Power	P_{RX}			-3	dBm	Average
Optical Center Wavelength	λ_C	1260		1620	nm	
Receiver Sensitivity	R_{X_SENS}			-20	dBm	BER< 10^{-12} , PRBS 2 ³¹ -1
Loss of Signal-Asserted	P_{LOS_A}	-34			dBm	
Loss of Signal-Deasserted	P_{LOS_D}			-22	dBm	
Optical Return Loss	ORL	12			dB	
LOS Hysteresis		0.5			dB	

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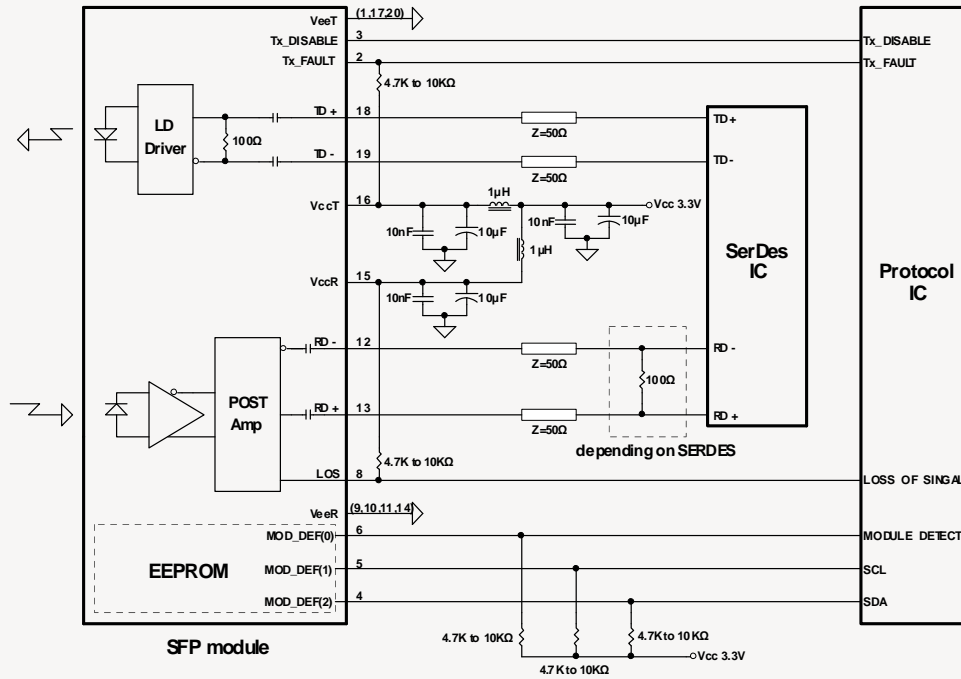
ELECTRICAL CHARACTERISTICS – HIGH-SPEED SIGNAL INTERFACE (CML)

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Differential Input Impedance	R_{IN}	85	100	115	Ω	
Differential data input swing	V_{IN_PP}	400		1600	mVpp	Internally AC coupled
Differential Output Impedance	R_{OUT}	85	100	115	Ω	
Differential data output swing	V_{OUT_PP}	400		1200	mVpp	Internally AC coupled

ELECTRICAL CHARACTERISTICS – LOW-SPEED SIGNAL INTERFACE (LVTTTL)

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Input High Voltage		2.0		$V_{CC}+0.3$	V	TX-DIS, TX-FAULT
Input Low Voltage		GND		0.8	V	
Output High Voltage		2.4		V_{CC}	V	RX-LOS
Output Low Voltage		GND		0.5	V	

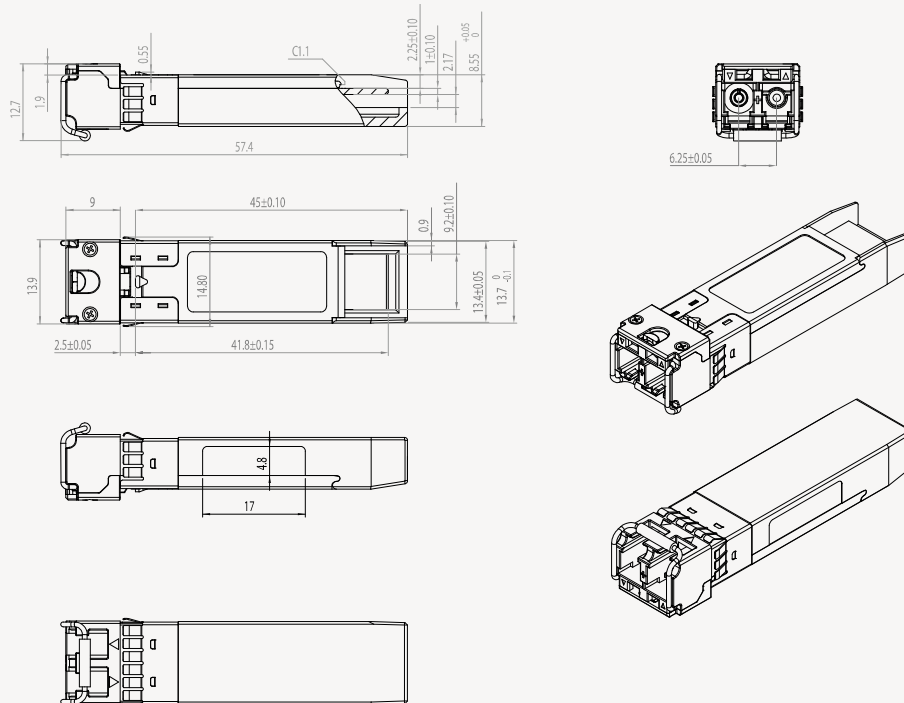
FUNCTIONAL DIAGRAM OF TRANSCEIVER



PIN ASSIGNMENT ACCORDING TO MSA

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 DIMENSIONS



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EXTENDED ORDERING INFORMATION, STANDARD

Part Number	Description
SO-SFP-MR50D-C27	SFP, 100Mbps-2.7Gbps, Multirate, CWDM, SM, DDM, 17dB, 50km, 1270nm
SO-SFP-MR50D-C29	SFP, 100Mbps-2.7Gbps, Multirate, CWDM, SM, DDM, 17dB, 50km, 1290nm
SO-SFP-MR50D-C31	SFP, 100Mbps-2.7Gbps, Multirate, CWDM, SM, DDM, 17dB, 50km, 1310nm
SO-SFP-MR50D-C33	SFP, 100Mbps-2.7Gbps, Multirate, CWDM, SM, DDM, 17dB, 50km, 1330nm
SO-SFP-MR50D-C35	SFP, 100Mbps-2.7Gbps, Multirate, CWDM, SM, DDM, 17dB, 50km, 1350nm
SO-SFP-MR50D-C37	SFP, 100Mbps-2.7Gbps, Multirate, CWDM, SM, DDM, 17dB, 50km, 1370nm
SO-SFP-MR50D-C39	SFP, 100Mbps-2.7Gbps, Multirate, CWDM, SM, DDM, 17dB, 50km, 1390nm
SO-SFP-MR50D-C41	SFP, 100Mbps-2.7Gbps, Multirate, CWDM, SM, DDM, 17dB, 50km, 1410nm
SO-SFP-MR50D-C43	SFP, 100Mbps-2.7Gbps, Multirate, CWDM, SM, DDM, 17dB, 50km, 1430nm
SO-SFP-MR50D-C45	SFP, 100Mbps-2.7Gbps, Multirate, CWDM, SM, DDM, 17dB, 50km, 1450nm
SO-SFP-MR50D-C47	SFP, 100Mbps-2.7Gbps, Multirate, CWDM, SM, DDM, 17dB, 50km, 1470nm
SO-SFP-MR50D-C49	SFP, 100Mbps-2.7Gbps, Multirate, CWDM, SM, DDM, 17dB, 50km, 1490nm
SO-SFP-MR50D-C51	SFP, 100Mbps-2.7Gbps, Multirate, CWDM, SM, DDM, 17dB, 50km, 1510nm
SO-SFP-MR50D-C53	SFP, 100Mbps-2.7Gbps, Multirate, CWDM, SM, DDM, 17dB, 50km, 1530nm
SO-SFP-MR50D-C55	SFP, 100Mbps-2.7Gbps, Multirate, CWDM, SM, DDM, 17dB, 50km, 1550nm
SO-SFP-MR50D-C57	SFP, 100Mbps-2.7Gbps, Multirate, CWDM, SM, DDM, 17dB, 50km, 1570nm
SO-SFP-MR50D-C59	SFP, 100Mbps-2.7Gbps, Multirate, CWDM, SM, DDM, 17dB, 50km, 1590nm
SO-SFP-MR50D-C61	SFP, 100Mbps-2.7Gbps, Multirate, CWDM, SM, DDM, 17dB, 50km, 1610nm

EXTENDED ORDERING INFORMATION, EXTENDED

Part Number	Description
SO-SFP-MR50D-C27-E	SFP, 100Mbps-2.7Gbps, Multirate, CWDM, SM, DDM, 17dB, 50km, 1270nm, ext. temp
SO-SFP-MR50D-C29-E	SFP, 100Mbps-2.7Gbps, Multirate, CWDM, SM, DDM, 17dB, 50km, 1290nm, ext. temp
SO-SFP-MR50D-C31-E	SFP, 100Mbps-2.7Gbps, Multirate, CWDM, SM, DDM, 17dB, 50km, 1310nm, ext. temp
SO-SFP-MR50D-C33-E	SFP, 100Mbps-2.7Gbps, Multirate, CWDM, SM, DDM, 17dB, 50km, 1330nm, ext. temp
SO-SFP-MR50D-C35-E	SFP, 100Mbps-2.7Gbps, Multirate, CWDM, SM, DDM, 17dB, 50km, 1350nm, ext. temp
SO-SFP-MR50D-C37-E	SFP, 100Mbps-2.7Gbps, Multirate, CWDM, SM, DDM, 17dB, 50km, 1370nm, ext. temp
SO-SFP-MR50D-C39-E	SFP, 100Mbps-2.7Gbps, Multirate, CWDM, SM, DDM, 17dB, 50km, 1390nm, ext. temp
SO-SFP-MR50D-C41-E	SFP, 100Mbps-2.7Gbps, Multirate, CWDM, SM, DDM, 17dB, 50km, 1410nm, ext. temp
SO-SFP-MR50D-C43-E	SFP, 100Mbps-2.7Gbps, Multirate, CWDM, SM, DDM, 17dB, 50km, 1430nm, ext. temp
SO-SFP-MR50D-C45-E	SFP, 100Mbps-2.7Gbps, Multirate, CWDM, SM, DDM, 17dB, 50km, 1450nm, ext. temp
SO-SFP-MR50D-C47-E	SFP, 100Mbps-2.7Gbps, Multirate, CWDM, SM, DDM, 17dB, 50km, 1470nm, ext. temp
SO-SFP-MR50D-C49-E	SFP, 100Mbps-2.7Gbps, Multirate, CWDM, SM, DDM, 17dB, 50km, 1490nm, ext. temp
SO-SFP-MR50D-C51-E	SFP, 100Mbps-2.7Gbps, Multirate, CWDM, SM, DDM, 17dB, 50km, 1510nm, ext. temp
SO-SFP-MR50D-C53-E	SFP, 100Mbps-2.7Gbps, Multirate, CWDM, SM, DDM, 17dB, 50km, 1530nm, ext. temp
SO-SFP-MR50D-C55-E	SFP, 100Mbps-2.7Gbps, Multirate, CWDM, SM, DDM, 17dB, 50km, 1550nm, ext. temp
SO-SFP-MR50D-C57-E	SFP, 100Mbps-2.7Gbps, Multirate, CWDM, SM, DDM, 17dB, 50km, 1570nm, ext. temp
SO-SFP-MR50D-C59-E	SFP, 100Mbps-2.7Gbps, Multirate, CWDM, SM, DDM, 17dB, 50km, 1590nm, ext. temp
SO-SFP-MR50D-C61-E	SFP, 100Mbps-2.7Gbps, Multirate, CWDM, SM, DDM, 17dB, 50km, 1610nm, ext. temp

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