

SO-SFP-MR120D-Dxxxx

SFP, 100Mbps-2.7Gbps, Multirate, DWDM 100GHz, SM, DDM, 33dB, 120km

OVERVIEW

The SO-SFP-MR120D-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 1528.77nm to 1565.50nm (C band) and 1578.69nm to 1610.06nm (L band) as specified by the ITU-T. It is designed to deploy in the DWDM networking equipment in metropolitan access and core networks. And they are designed to be compliant with SFF-8472 Multi-Source Agreement (MSA). 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.

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-MR120D-Dxxxx	SFP, 100Mbps-2.7Gbps, Multirate, DWDM 100GHz, SM, DDM, 33dB, 120km
SO-SFP-MR120D-Dxxxx-E	SFP, 100Mbps-2.7Gbps, Multirate, DWDM 100GHz, SM, DDM, 33dB, 120km, 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-MR120D-Dxxxx	0		+70	°C
		SO-SFP-MR120D-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		Mbps	
	OC-12/STM-4		622			
	OC-3/STM-1		155			
	FE		100			

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+0.3	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

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Parameter	Symbol	Min	Typ	Max	Unit
Data Rate			2.5		Gbps

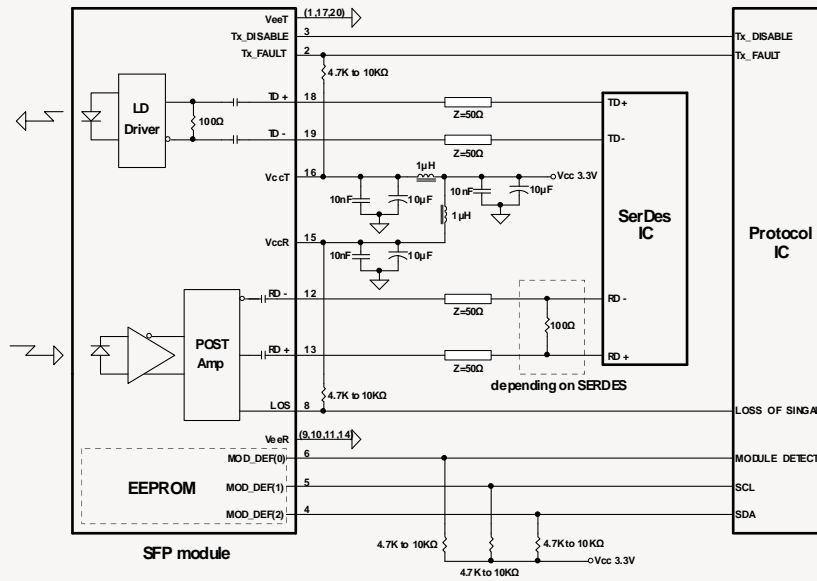
PERFORMANCE SPECIFICATIONS – OPTICAL TRANSMITTER

Parameter	Symbol	Min	Typ	Max	Unit
Centre Wavelength	λ_c	1528		1610	nm
Spectral Width (RMS)	$\Delta\lambda$			0.3	nm
Side Mode Suppression Ratio	SMSR	30			dB
Channel Spacing	Δf		100		GHz
Deviation From Central Frequency@EOL		-12		12	Ghz
Average Output Power	P_{out}	2		5	dBm
Average Launch Power (Tx: OFF)	P_{off}			-45	dBm
Extinction Ratio	ER	8.2			dB
Rise/Fall Time(20%~80%)	t_r/t_f			150	ps
Output Optical Eye		Compatible with IEEE 802.3			
TX Disable Assert Time	t_{off}			10	us
Pout@TX Disable Asserted	P_{out}			-45	dBm
Optical Signal Noise Ratio@0.1nm	OSNR		40		dB
Relative Intensity Noise	RIN			-135	dB/Hz
Dispersion Tolerance	DT		4000		ps/nm

PERFORMANCE SPECIFICATIONS – OPTICAL RECEIVER

Parameter	Symbol	Min	Typ	Max	Unit
Centre Wavelength	λ	1528		1620	nm
Receiver Sensitivity	Multirate P_{min}			-31	dBm
Receiver Overload	P_{max}	-9			dBm
LOS De-Assert	LOSD			-32	dBm
LOS Assert	LOSA	-44			dBm
LOS Hysteresis		0.5			dB

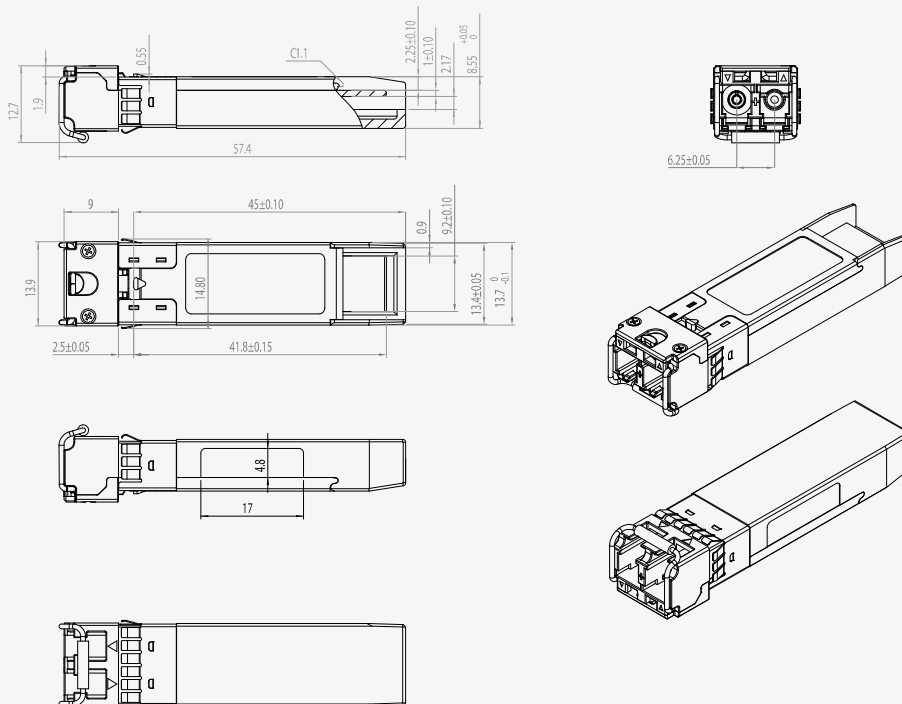
RECOMMENDED CIRCUIT SCHEMATIC



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 pull-down 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 pull-down 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



ORDERING INFORMATION

Part Number	ITU channel no.	Frequency (THz)	Center Wavelength (nm)
SO-SFP-MR120D D862	62	186.2	1610.06
SO-SFP-MR120D D863	63	186.3	1609.19
SO-SFP-MR120D D864	64	186.4	1608.33
SO-SFP-MR120D D865	65	186.5	1607.47
SO-SFP-MR120D D866	66	186.6	1606.60
SO-SFP-MR120D D867	67	186.7	1605.74
SO-SFP-MR120D D868	68	186.8	1604.88
SO-SFP-MR120D D869	69	186.9	1604.03
SO-SFP-MR120D D870	70	187.0	1603.17
SO-SFP-MR120D D871	71	187.1	1602.31
SO-SFP-MR120D D872	72	187.2	1601.46
SO-SFP-MR120D D873	73	187.3	1600.60
SO-SFP-MR120D D874	74	187.4	1599.75
SO-SFP-MR120D D875	75	187.5	1598.89
SO-SFP-MR120D D876	76	187.6	1598.04
SO-SFP-MR120D D877	77	187.7	1597.19
SO-SFP-MR120D D878	78	187.8	1596.34
SO-SFP-MR120D D879	79	187.9	1595.49
SO-SFP-MR120D D880	80	188.0	1594.64
SO-SFP-MR120D D881	81	188.1	1593.79
SO-SFP-MR120D D882	82	188.2	1592.95
SO-SFP-MR120D D883	83	188.3	1592.10
SO-SFP-MR120D D884	84	188.4	1591.26
SO-SFP-MR120D D885	85	188.5	1590.41
SO-SFP-MR120D D886	86	188.6	1589.57

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SO-SFP-MR120D D887	87	188.7	1588.73
SO-SFP-MR120D D888	88	188.8	1587.88
SO-SFP-MR120D D889	89	188.9	1587.04
SO-SFP-MR120D D890	90	189.0	1586.20
SO-SFP-MR120D D891	91	189.1	1585.36
SO-SFP-MR120D D892	92	189.2	1584.53
SO-SFP-MR120D D893	93	189.3	1583.69
SO-SFP-MR120D D894	94	189.4	1582.85
SO-SFP-MR120D D895	95	189.5	1582.02
SO-SFP-MR120D D896	96	189.6	1581.18
SO-SFP-MR120D D897	97	189.7	1580.35
SO-SFP-MR120D D898	98	189.8	1579.52
SO-SFP-MR120D D899	99	189.9	1578.69
SO-SFP-MR120D D900	0	190.0	1577.86
SO-SFP-MR120D D901	1	190.1	1577.03
SO-SFP-MR120D D902	2	190.2	1576.20
SO-SFP-MR120D D903	3	190.3	1575.37
SO-SFP-MR120D D904	4	190.4	1574.54
SO-SFP-MR120D D905	5	190.5	1573.71
SO-SFP-MR120D D906	6	190.6	1572.89
SO-SFP-MR120D D907	7	190.7	1572.06
SO-SFP-MR120D D908	8	190.8	1571.24
SO-SFP-MR120D D909	9	190.9	1570.42
SO-SFP-MR120D D910	10	191.0	1569.59
SO-SFP-MR120D D911	11	191.1	1568.77
SO-SFP-MR120D D912	12	191.2	1567.95
SO-SFP-MR120D D913	13	191.3	1567.13
SO-SFP-MR120D D914	14	191.4	1566.31
SO-SFP-MR120D D915	15	191.5	1565.50
SO-SFP-MR120D-D916	16	191.6	1564.68
SO-SFP-MR120D-D917	17	191.7	1563.86
SO-SFP-MR120D-D918	18	191.8	1563.05
SO-SFP-MR120D-D919	19	191.9	1562.23
SO-SFP-MR120D-D920	20	192.0	1561.42
SO-SFP-MR120D-D921	21	192.1	1560.61
SO-SFP-MR120D-D922	22	192.2	1559.79
SO-SFP-MR120D-D923	23	192.3	1558.98
SO-SFP-MR120D-D924	24	192.4	1558.17
SO-SFP-MR120D-D925	25	192.5	1557.36
SO-SFP-MR120D-D926	26	192.6	1556.55
SO-SFP-MR120D-D927	27	192.7	1555.75
SO-SFP-MR120D-D928	28	192.8	1554.94
SO-SFP-MR120D-D929	29	192.9	1554.13
SO-SFP-MR120D-D930	30	193.0	1553.33
SO-SFP-MR120D-D931	31	193.1	1552.52
SO-SFP-MR120D-D932	32	193.2	1551.72
SO-SFP-MR120D-D933	33	193.3	1550.92
SO-SFP-MR120D-D934	34	193.4	1550.12
SO-SFP-MR120D-D935	35	193.5	1549.32
SO-SFP-MR120D-D936	36	193.6	1548.51

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SO-SFP-MR120D-D937	37	193.7	1547.72
SO-SFP-MR120D-D938	38	193.8	1546.92
SO-SFP-MR120D-D939	39	193.9	1546.12
SO-SFP-MR120D-D940	40	194.0	1545.32
SO-SFP-MR120D-D941	41	194.1	1544.53
SO-SFP-MR120D-D942	42	194.2	1543.73
SO-SFP-MR120D-D943	43	194.3	1542.94
SO-SFP-MR120D-D944	44	194.4	1542.14
SO-SFP-MR120D-D945	45	194.5	1541.35
SO-SFP-MR120D-D946	46	194.6	1540.56
SO-SFP-MR120D-D947	47	194.7	1539.77
SO-SFP-MR120D-D948	48	194.8	1538.98
SO-SFP-MR120D-D949	49	194.9	1538.19
SO-SFP-MR120D-D950	50	195.0	1537.40
SO-SFP-MR120D-D951	51	195.1	1536.61
SO-SFP-MR120D-D952	52	195.2	1535.82
SO-SFP-MR120D-D953	53	195.3	1535.04
SO-SFP-MR120D-D954	54	195.4	1534.25
SO-SFP-MR120D-D955	55	195.5	1533.47
SO-SFP-MR120D-D956	56	195.6	1532.68
SO-SFP-MR120D-D957	57	195.7	1531.90
SO-SFP-MR120D-D958	58	195.8	1531.12
SO-SFP-MR120D-D959	59	195.9	1530.33
SO-SFP-MR120D-D960	60	196.0	1529.55
SO-SFP-MR120D-D961	61	196.1	1528.77