

ESO-SFP-L120D-DXXX

SFP, 1.25 Gbps GigE/FC, DWDM, 100GHz, SM, DDM, 32dB, 120km

SO-SFP-L120D-DXXX OVERVIEW

The SO-SFP-L120D-Dxxx fiber optical SFP (Small Form Pluggable) transceivers include an APD diode and a cooled DWDM DFB transmitter. The modules operate at multiple data-rates up to 1.25 Gbps and supports protocols like Gigabit Ethernet 1000BASE, Fibre Channel 1G. The DWDM modules operate at nominal Dense Wavelength Division Multiplexing (DWDM) wavelengths on the 100GHz grid as defined in the ITU-T 694.1 standard and all wavelengths of the fiber C-band are available (1528.77nm – 1565.50nm).

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 60-62 according to SFF document SFF-8472 rev 10.5, "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 1.25 Gbps
- 100GHz DWDM wavelength ITU 17- ITU 61
- APD Receiver
- Duplex LC connector
- Hot-pluggable SFP footprint
- Built-in digital diagnostic functions
- Up to 120km 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:
 - 0°C to 70°C standard
- Compliant with SFF-8472 (DDMI)

APPLICATIONS

- DWDM and WAN connectivity
- 1G Fibre Channel FC100
- 100Base-X/1000Base-X Ethernet

ORDERING INFORMATION

Part Number	Description
SO-SFP-L120D-Dxxx	SFP, 1.25 Gbps GigE/FC, DWDM, 100GHz, SM, DDM, 32dB, 120km

GENERAL SPECIFICATIONS

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Data Rate	DR	0.1		1.25	Gbps	
Bit Error Rate	BER			10^{-12}		
Operating Temperature	T _{OP}	0		70	°C	Case temperature
Operating Relative Humidity				95	%	
Storage Temperature	T _{STO}	-40		85	°C	Ambient temperature
Supply Current	I _S			450	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

End of Life, overall operating conditions

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Output Optical Power	P _{TX}	0		+5	dBm	Average, coupled into 9/125um SMF
Extinction ratio	E _r	8.2			dB	
Optical Center Wavelength	λ _C	According to ITU-T 694.1			nm	
Deviation From Central Frequency		-12		12	GHz	
Spectral Width (-20dB)	Δλ			0.3	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Rise/Fall Time	t _r /t _f			260	psec	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
Channel Spacing	Δf		100		GHz	
TX Disable Asserted	P _{out}			-45	dBm	
Optical Signal Noise Ratio	OSNR		40		dB	
Relative Intensity Noise	RIN			-135	dB/Hz	
Dispersion Tolerance	DT		2400		ps/nm	

OPTICAL CHARACTERISTICS – RECEIVER

End of Life, overall operating conditions

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Optical Receiver Power	P _{RX}			-10	dBm	Average
Optical Center Wavelength	λ _C	1528		1566	nm	
Receiver Sensitivity	R _{X_SENS}			-32	dBm	BER<10 ⁻¹² , PRBS 2 ³¹ -1
Loss of Signal-Asserted	P _{LOS_A}	-45			dBm	

Subject to change without notice.

For more information visit smaroptics.com.

Loss of Signal-Deasserted	P_{LOS_D}		-33	dBm
Optical Return Loss	ORL	12		dB
LOS Hysteresis		0.5		dB

ELECTRICAL CHARACTERISTICS – HIGH-SPEED SIGNAL INTERFACE (CML)

End of Life, overall operating conditions

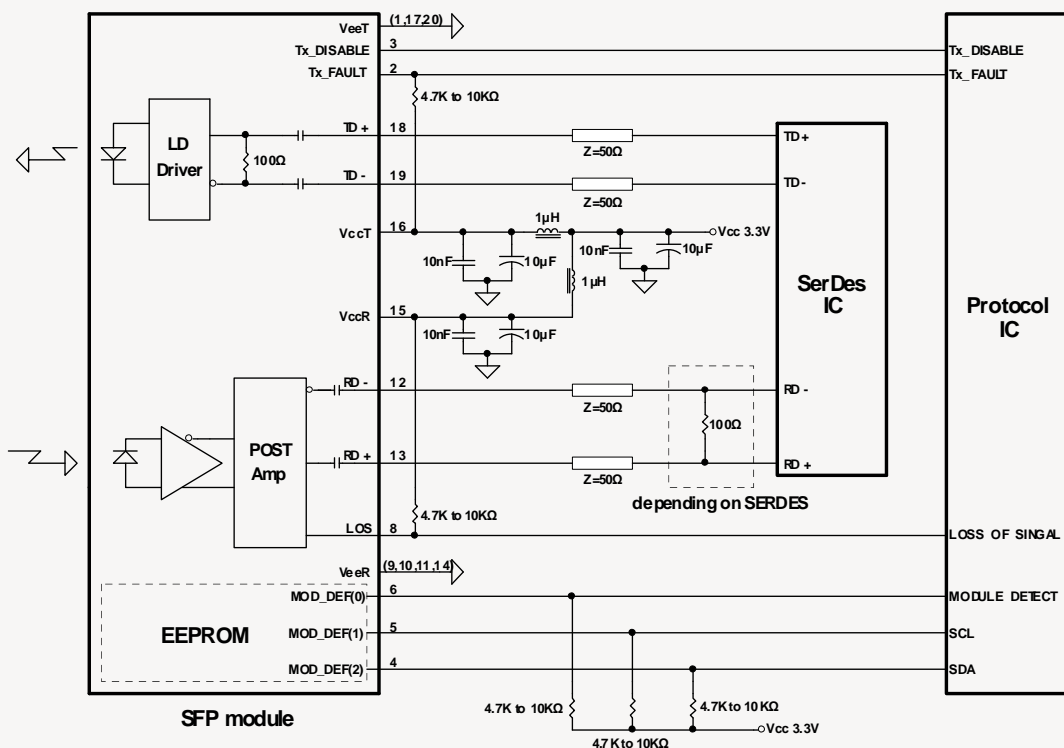
Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Differential Input Impedance	R_{IN}	85	100	115	Ω	
Differential data input swing	V_{IN_PP}	400		2000	mVpp	Internally AC coupled
Differential Output Impedance	R_{OUT}	85	100	115	Ω	
Differential data output swing	V_{OUT_PP}	400		2000	mVpp	Internally AC coupled

ELECTRICAL CHARACTERISTICS – LOW-SPEED SIGNAL INTERFACE (LVTTTL)

End of Life, overall operating conditions

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	

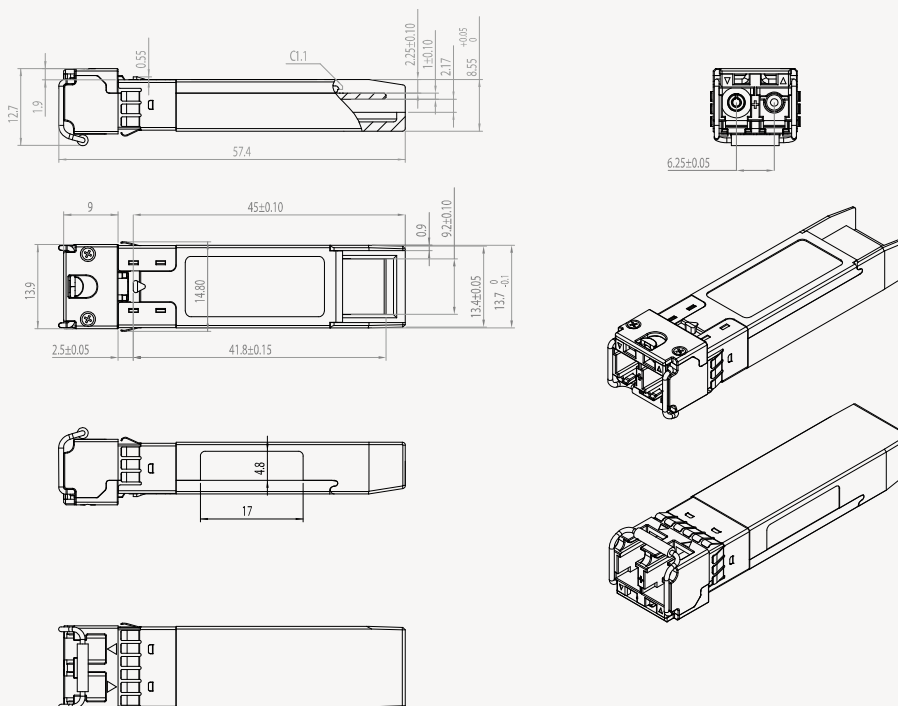
RECOMMENDED CIRCUIT SCHEMATIC



PIN ASSIGNMENT ACCORDING TO MSA

Pin	Signal Name	Description	Pin	Signal Name	Description
1	TXGND	Transmitter Signal Ground	10	TXGND	Transmitter Signal Ground
2	TX_FAULT	Transmitter Fault Indication. Logic "1" Output = Laser Fault. Logic "0" Output = Normal Operation	11	TX+	Transmitter Data In
3	TX_DISABLE	Logic "1" Input (or no connection) = Laser off, Logic "0" = Laser on.	12	TX-	Transmitter Data In
4	DA	Modulation Definition 2 – Two wires serial ID Interface	13	TXGND	Transmitter Signal Ground
5	DL	Modulation Definition 1 – Two wires serial ID Interface	14	TXP	Transmitter Power – 3.3V±5%
6	DD-ABS	Modulation Definition 0 – Ground in Module	15	TXGND	Transmitter Signal Ground
7	RS0	Rate Select (LVTTL). This pin has an internal 30k Ohm pull-down to ground. A signal on this pin will not affect module performance.	16	TXGND	Transmitter Signal Ground
8	TX_LOS	Loss of Signal Out (OC).	17	TX+	Transmitter Data In
9	RS1	Rate Select (LVTTL). This pin has an internal 30k Ohm pull-down to ground. A signal on this pin will not affect module performance.	18	TX-	Transmitter Data In
10	TXGND	Transmitter Signal Ground	19	TXGND	Transmitter Signal Ground

MECHANICAL DIMENSIONS



ORDERING INFORMATION

Part Number	ITU channel no.	Frequency [THz]	Center Wavelength (nm)
SO-SFP-L120D-D915	15	191.5	1565.50
SO-SFP-L120D-D916	16	191.6	1564.68
SO-SFP-L120D-D917	17	191.7	1563.86
SO-SFP-L120D-D918	18	191.8	1563.05
SO-SFP-L120D-D919	19	191.9	1562.23
SO-SFP-L120D-D920	20	192.0	1561.42
SO-SFP-L120D-D921	21	192.1	1560.61
SO-SFP-L120D-D922	22	192.2	1559.79
SO-SFP-L120D-D923	23	192.3	1558.98
SO-SFP-L120D-D924	24	192.4	1558.17
SO-SFP-L120D-D925	25	192.5	1557.36
SO-SFP-L120D-D926	26	192.6	1556.55
SO-SFP-L120D-D927	27	192.7	1555.75
SO-SFP-L120D-D928	28	192.8	1554.94
SO-SFP-L120D-D929	29	192.9	1554.13
SO-SFP-L120D-D930	30	193.0	1553.33
SO-SFP-L120D-D931	31	193.1	1552.52
SO-SFP-L120D-D932	32	193.2	1551.72
SO-SFP-L120D-D933	33	193.3	1550.92
SO-SFP-L120D-D934	34	193.4	1550.12
SO-SFP-L120D-D935	35	193.5	1549.32
SO-SFP-L120D-D936	36	193.6	1548.51
SO-SFP-L120D-D937	37	193.7	1547.72
SO-SFP-L120D-D938	38	193.8	1546.92
SO-SFP-L120D-D939	39	193.9	1546.12
SO-SFP-L120D-D940	40	194.0	1545.32
SO-SFP-L120D-D941	41	194.1	1544.53
SO-SFP-L120D-D942	42	194.2	1543.73
SO-SFP-L120D-D943	43	194.3	1542.94
SO-SFP-L120D-D944	44	194.4	1542.14
SO-SFP-L120D-D945	45	194.5	1541.35
SO-SFP-L120D-D946	46	194.6	1540.56
SO-SFP-L120D-D947	47	194.7	1539.77
SO-SFP-L120D-D948	48	194.8	1538.98
SO-SFP-L120D-D949	49	194.9	1538.19
SO-SFP-L120D-D950	50	195.0	1537.40
SO-SFP-L120D-D951	51	195.1	1536.61
SO-SFP-L120D-D952	52	195.2	1535.82
SO-SFP-L120D-D953	53	195.3	1535.04
SO-SFP-L120D-D954	54	195.4	1534.25
SO-SFP-L120D-D955	55	195.5	1533.47
SO-SFP-L120D-D956	56	195.6	1532.68
SO-SFP-L120D-D957	57	195.7	1531.90
SO-SFP-L120D-D958	58	195.8	1531.12
SO-SFP-L120D-D959	59	195.9	1530.33
SO-SFP-L120D-D960	60	196.0	1529.55
SO-SFP-L120D-D961	61	196.1	1528.77