

# SO-SFP-622M-L160D-Cxx

SFP, 622 Mbps, CWDM, SM, DDM, 41dB, 160km

## OVERVIEW

The SO-SFP-622M-L160D-Cxx series single mode transceiver is small form factor pluggable module for serial optical data communications such as SONET OC-12/SDH STM-4 and Fast Ethernet. 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 CWDM. There are eighteen center wavelengths available from 1270nm to 1610nm, with each step 20nm. The transmitter section uses a multiple quantum well CWDM DFB laser and is a class 1 laser compliant according to International Safety Standard IEC-60825. The receiver section uses an integrated InGaAs avalanche detector preamplifier (IDP) mounted in an optical header and a limiting post-amplifier IC. The SO-SFP-622M-L160D-Cxx series are designed to be compliant with SFF-8472.

## PRODUCT FEATURES

- Operating data rate up to 622Mbps
- 18-Wavelength CWDM DFB LD transmitter from 1270nm to 1610nm, with step 20nm
- 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
- Operating case temperature
  - Standard 0°C to 70°C.
  - Extended -20°C to +85°C.
- Compliant with SFP MSA
- Compliant with SFF-8472

## APPLICATIONS

- SDH/SONET
- Fast Ethernet
- CWDM, Optical networking and equipment connectivity

## ORDERING INFORMATION

Part Number	Description
SO-SFP-622M-L160D-Cxx*	SFP, 622 Mbps, CWDM, SM, DDM, 41dB, 160km
SO-SFP-622M-L160D-Cxx-E*	SFP, 622 Mbps, CWDM, SM, DDM, 41dB, 160km, Ext. temp

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

## 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
Operating Case Temperature	Tc	SO-SFP-622M-L160D-Cxx	0	+70	°C
		SO-SFP-622M-L160D-Cxx -E	-20	+85	°C
Power Supply Voltage	Vcc	3.15	3.3	3.45	V
Power Supply Current	Icc			300	mA
Data Rate	OC-12/STM-4		622		Mbps
	OC-3/STM-1		155		
	100M		100		

## PERFORMANCE SPECIFICATIONS – ELECTRICAL TRANSMITTER

Parameter	Symbol	Min	Typ	Max	Unit	Notes
LVPECL Inputs(Differential)	V <sub>IN</sub>	400		2000	mVpp	AC coupled inputs
Input Impedance (Differential)	Z <sub>IN</sub>	85	100	115	ohms	R <sub>in</sub> > 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
LVPECL Outputs (Differential)	V <sub>out</sub>	370		2000	mVpp	AC coupled outputs
Output Impedance (Differential)	Z <sub>out</sub>	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		0.8	V	

## PERFORMANCE SPECIFICATIONS – OPTICAL

Parameter	Symbol	Min	Typ	Max	Unit
Data Rate		100	622		Mbps

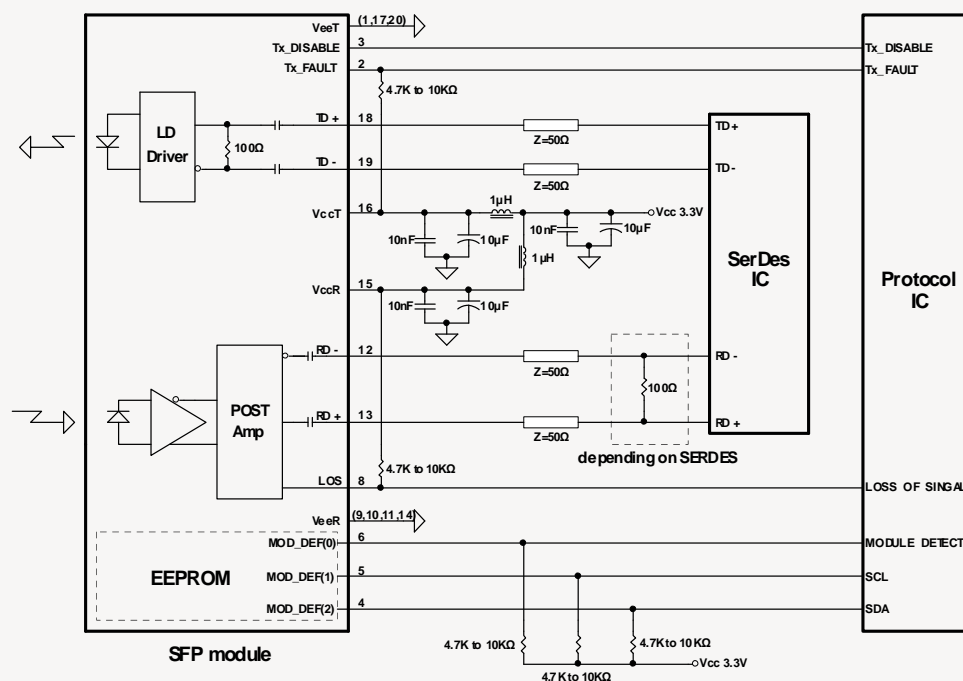
## PERFORMANCE SPECIFICATIONS – OPTICAL TRANSMITTER

Parameter	Symbol	Min	Typ	Max	Unit
Centre Wavelength	$\lambda_c$	$\lambda_c-5.5$	$\lambda_c$	$\lambda_c+7.5$	nm
Spectral Width (RMS)	$\Delta\lambda$			1	nm
Average Output Power	$P_{out}$	3		6	dBm
Extinction Ratio	ER	10			dB
Side Mode Suppression Ratio	SMSR	30			dB
Rise/Fall Time(20%~80%)	$t_r/t_f$			2	ns
Output Optical Eye		IUT-T G.957 Compliant			
TX Disable Assert Time	$t_{off}$			10	us

## PERFORMANCE SPECIFICATIONS – OPTICAL RECEIVER

Parameter	Symbol	Min	Typ	Max	Unit
Centre Wavelength	$\lambda$	1100		1650	nm
Receiver Sensitivity	OC-12/STM-4			-38	dBm
	OC-3/STM-1			-38	
	100M			-38	
Receiver Overload	$P_{max}$	-8			dBm
Return Loss		14			dB
Optical Path Penalty				1	dB
LOS De-Assert	LOSD			-38	dBm
LOS Assert	LOSA	-47			dBm
LOS Hysteresis		2			dB

## FUNCTIONAL DIAGRAM OF TRANSCEIVER



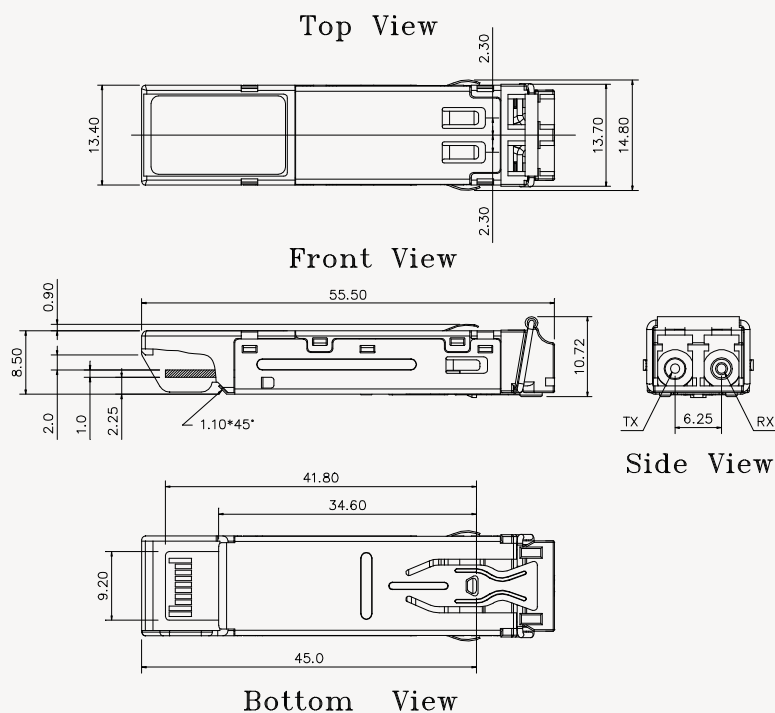
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## PIN ASSIGNMENT ACCORDING TO MSA

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

## MECHANICAL DIMENSIONS



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## EXTENDED ORDERING INFORMATION, STANDARD

Part Number	Description
SO-SFP-622M-L160D-C27	SFP, 622 Mbps, CWDM, SM, DDM, 41 dB, 160km, 1270nm
SO-SFP-622M-L160D-C29	SFP, 622 Mbps, CWDM, SM, DDM, 41 dB, 160km, 1290nm
SO-SFP-622M-L160D-C31	SFP, 622 Mbps, CWDM, SM, DDM, 41 dB, 160km, 1310nm
SO-SFP-622M-L160D-C33	SFP, 622 Mbps, CWDM, SM, DDM, 41 dB, 160km, 1330nm
SO-SFP-622M-L160D-C35	SFP, 622 Mbps, CWDM, SM, DDM, 41 dB, 160km, 1350nm
SO-SFP-622M-L160D-C37	SFP, 622 Mbps, CWDM, SM, DDM, 41 dB, 160km, 1370nm
SO-SFP-622M-L160D-C39	SFP, 622 Mbps, CWDM, SM, DDM, 41 dB, 160km, 1390nm
SO-SFP-622M-L160D-C41	SFP, 622 Mbps, CWDM, SM, DDM, 41 dB, 160km, 1410nm
SO-SFP-622M-L160D-C43	SFP, 622 Mbps, CWDM, SM, DDM, 41 dB, 160km, 1430nm
SO-SFP-622M-L160D-C45	SFP, 622 Mbps, CWDM, SM, DDM, 41 dB, 160km, 1450nm
SO-SFP-622M-L160D-C47	SFP, 622 Mbps, CWDM, SM, DDM, 41 dB, 160km, 1470nm
SO-SFP-622M-L160D-C49	SFP, 622 Mbps, CWDM, SM, DDM, 41 dB, 160km, 1490nm
SO-SFP-622M-L160D-C51	SFP, 622 Mbps, CWDM, SM, DDM, 41 dB, 160km, 1510nm
SO-SFP-622M-L160D-C53	SFP, 622 Mbps, CWDM, SM, DDM, 41 dB, 160km, 1530nm
SO-SFP-622M-L160D-C55	SFP, 622 Mbps, CWDM, SM, DDM, 41 dB, 160km, 1550nm
SO-SFP-622M-L160D-C57	SFP, 622 Mbps, CWDM, SM, DDM, 41 dB, 160km, 1570nm
SO-SFP-622M-L160D-C59	SFP, 622 Mbps, CWDM, SM, DDM, 41 dB, 160km, 1590nm
SO-SFP-622M-L160D-C61	SFP, 622 Mbps, CWDM, SM, DDM, 41 dB, 160km, 1610nm

## EXTENDED ORDERING INFORMATION, EXTENDED

Part Number	Description
SO-SFP-622M-L160D-C27-E	SFP, 622 Mbps, CWDM, SM, DDM, 41 dB, 160km, 1270nm, Ext. temp
SO-SFP-622M-L160D-C29-E	SFP, 622 Mbps, CWDM, SM, DDM, 41 dB, 160km, 1290nm, Ext. temp
SO-SFP-622M-L160D-C31-E	SFP, 622 Mbps, CWDM, SM, DDM, 41 dB, 160km, 1310nm, Ext. temp
SO-SFP-622M-L160D-C33-E	SFP, 622 Mbps, CWDM, SM, DDM, 41 dB, 160km, 1330nm, Ext. temp
SO-SFP-622M-L160D-C35-E	SFP, 622 Mbps, CWDM, SM, DDM, 41 dB, 160km, 1350nm, Ext. temp
SO-SFP-622M-L160D-C37-E	SFP, 622 Mbps, CWDM, SM, DDM, 41 dB, 160km, 1370nm, Ext. temp
SO-SFP-622M-L160D-C39-E	SFP, 622 Mbps, CWDM, SM, DDM, 41 dB, 160km, 1390nm, Ext. temp
SO-SFP-622M-L160D-C41-E	SFP, 622 Mbps, CWDM, SM, DDM, 41 dB, 160km, 1410nm, Ext. temp
SO-SFP-622M-L160D-C43-E	SFP, 622 Mbps, CWDM, SM, DDM, 41 dB, 160km, 1430nm, Ext. temp
SO-SFP-622M-L160D-C45-E	SFP, 622 Mbps, CWDM, SM, DDM, 41 dB, 160km, 1450nm, Ext. temp
SO-SFP-622M-L160D-C47-E	SFP, 622 Mbps, CWDM, SM, DDM, 41 dB, 160km, 1470nm, Ext. temp
SO-SFP-622M-L160D-C49-E	SFP, 622 Mbps, CWDM, SM, DDM, 41 dB, 160km, 1490nm, Ext. temp
SO-SFP-622M-L160D-C51-E	SFP, 622 Mbps, CWDM, SM, DDM, 41 dB, 160km, 1510nm, Ext. temp
SO-SFP-622M-L160D-C53-E	SFP, 622 Mbps, CWDM, SM, DDM, 41 dB, 160km, 1530nm, Ext. temp
SO-SFP-622M-L160D-C55-E	SFP, 622 Mbps, CWDM, SM, DDM, 41 dB, 160km, 1550nm, Ext. temp
SO-SFP-622M-L160D-C57-E	SFP, 622 Mbps, CWDM, SM, DDM, 41 dB, 160km, 1570nm, Ext. temp
SO-SFP-622M-L160D-C59-E	SFP, 622 Mbps, CWDM, SM, DDM, 41 dB, 160km, 1590nm, Ext. temp
SO-SFP-622M-L160D-C61-E	SFP, 622 Mbps, CWDM, SM, DDM, 41 dB, 160km, 1610nm, Ext. temp

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