

# SO-SFP-100BASE-L160D

SFP, 100/155Mbps FE, 1550nm, SM, DDM, 34dB, 160km

## OVERVIEW

The SO-SFP-100Base-L160D series single-mode transceiver is small form factor pluggable module for duplex optical data communications such as Fast Ethernet and OC-3/STM-1 SDH/SONET. 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 1550nm. The transmitter section uses a multiple quantum well 1550nm DFB laser and is a class 1 laser compliant according to International Safety Standard IEC 60825. The receiver section uses an integrated InGaAs detector preamplifier (IDP) mounted in an optical header and a limiting post-amplifier IC. The SO-SFP-100BASE-L160D series are designed to be compliant with SFF-8472 Multi-Source Agreement (MSA).

## PRODUCT FEATURES

- Operating data rate up to 155Mbps
- 160km with 9/125  $\mu\text{m}$  SMF
- Single 3.3V power supply and TTL logic interface
- Hot-Pluggable SFP footprint duplex LC connector interface
- Class 1 FDA and IEC60825-1 laser safety compliant
- Operating temperature
  - Standard: 0 °C~+70 °C
  - Industrial: -40 °C~+85 °C
- Compliant with SFP MSA specification
- Compliant with Digital Diagnostic Monitor (DDM) interface
- RoHS 6/6 compliant

## APPLICATIONS

- Fast Ethernet
- SDH/SONET
- ATM switches and routers
- Other optical links

## ORDERING INFORMATION

Part Number	Description
SO-SFP-100Base-L160D	SFP, 100/155Mbps FE, 1550nm, SM, DDM, 34dB, 160km
SO-SFP-100Base-L160D-I	SFP, 100/155Mbps FE, 1550nm, SM, DDM, 34dB, 160km, ind.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	TA	SO-SFP-100Base-L160D	0	+70	°C
		SO-SFP-100Base-L160D-I	-40	+85	
Power Supply Voltage	Vcc	3.15	3.3	3.45	V
Power Supply Current	Icc			300	mA
Data rate	OC-3/STM-1		155		Mbps
		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		0.5		

## PERFORMANCE SPECIFICATIONS – ELECTRICAL RECEIVER

Parameter	Symbol	Min	Typ	Max	Unit	Notes
LVPECL Outputs (Differential)	V <sub>out</sub>	400		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		0.5	V	

## OPTICAL AND ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Min	Typ	Max	Unit
9µm Core Diameter MMF	L		160		km
Data Rate			100/155		Mbps

## OPTICAL AND ELECTRICAL CHARACTERISTICS TRANSMITTER

Parameter	Symbol	Min	Typ	Max	Unit
Centre Wavelength	λ <sub>c</sub>	1480	1550	1580	nm

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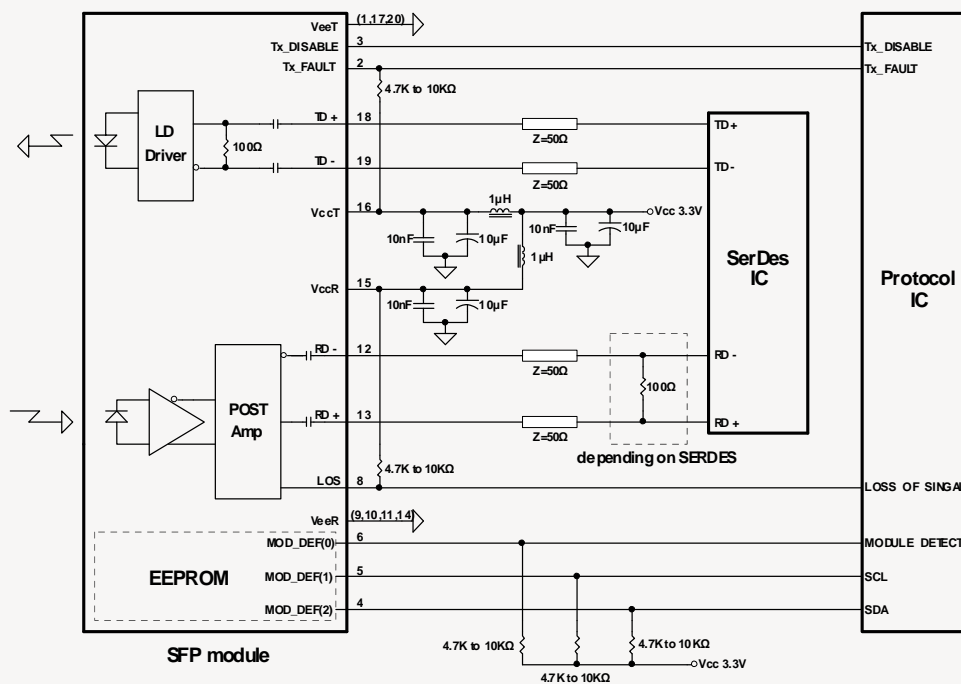
For more information, visit [smartoptics.com](http://smartoptics.com).

Spectral Width (RMS))	$\Delta\lambda$		1	nm
Average Output Power	$P_{out}$	2	7	dBm
Extinction Ratio	$ER$	10		dB
Side Mode Suppression Ratio	$SMSR$	30		dB
Rise/Fall Time(20%~80%)	$tr/tf$		2	ns
Output Optical Eye	IUT-T G.957 Compliant			
TX Disable Assert Time	$t_{off}$		10	us

### OPTICAL AND ELECTRICAL CHARACTERISTICS RECEIVER

Parameter	Symbol	Min	Typ	Max	Unit
Centre Wavelength	$\lambda$	1260		1600	nm
Receiver Sensitivity	$P_{min}$			-35	dBm
Receiver Overload	$P_{max}$	-10			dBm
Optical Path Penalty				1	dB
LOS De-Assert	$LOSD$			-36	dBm
LOS Assert	$LOSA$	-45			dBm
LOS Hysteresis		0.5			dB

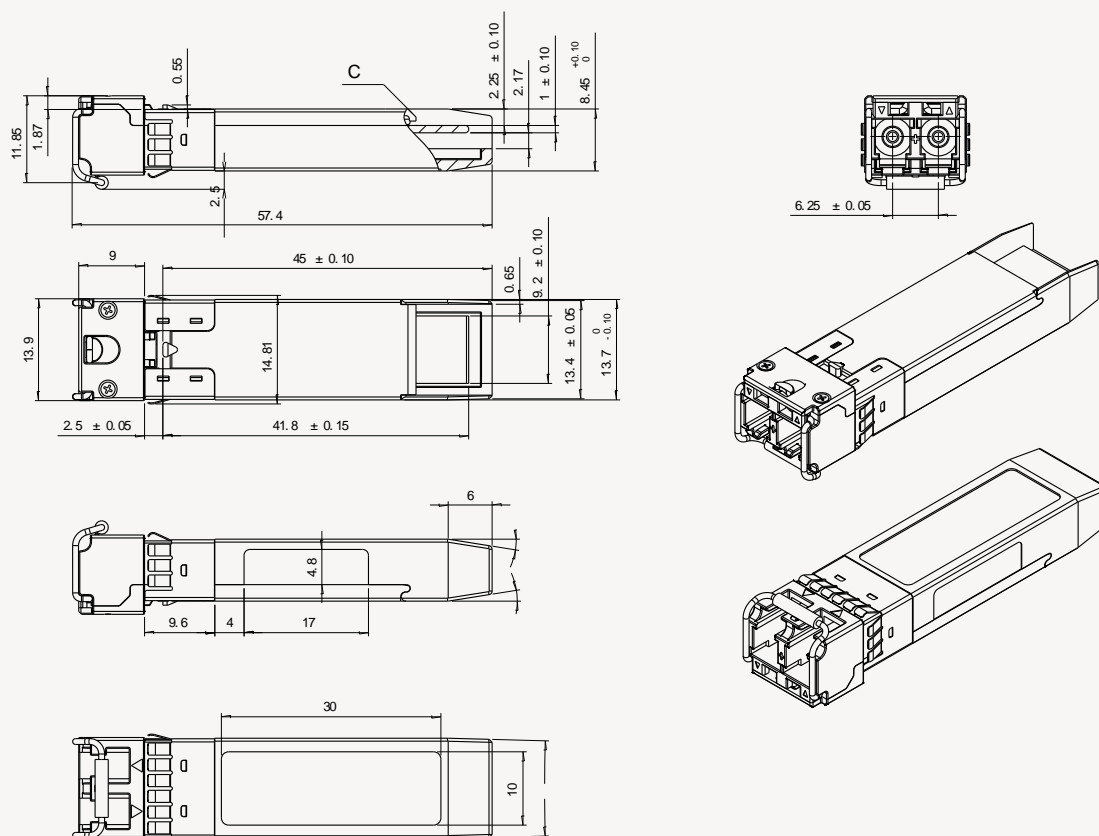
### RECOMMENDED CIRCUIT SCHEMATIC



### PIN FUNCTION DEFINITIONS

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 pulldown 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 pulldown 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 DRAWING



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