

# SO-SFP-1000BASE-ZXD

SFP, 1.25 Gbps GigE, 1550nm, SM/MM, DDM, 24dB, 80km

## OVERVIEW

The SO-SFP-1000BASE-ZXD series single-mode transceiver is small form factor pluggable module for serial optical data communications such as IEEE 802.3z Gigabit Ethernet 1000BASE-ZX and Fibre Channel 1x SM-LC-L FC-PI. 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-1000BASE-ZXD series are designed to be compliant with SFF-8472 SFP Multi-Source Agreement (MSA).

## PRODUCT FEATURES

- Operating data rate up to 1.25Gbps
- 1550nm DFB laser transmitter
- 80km with 9/125  $\mu$ m SMF
- Single 3.3V power supply and LVTTTL 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 MSA SFP specification
- Compliant with SFF-8472
- RoHS 6/6 compliant

## APPLICATIONS

- Gigabit Ethernet switches and routers
- Fibre Channel switch infrastructure
- Other optical links

## ORDERING INFORMATION

Part Number	Description
SO-SFP-1000BASE-ZXD	SFP, 1.25 Gbps GigE, 1550nm, SM/MM, DDM, 24dB, 80km
SO-SFP-1000BASE-ZXD-I	SFP, 1.25 Gbps GigE, 1550nm, SM/MM, DDM, 24dB, 80km, ind. temp.

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

## 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-1000BASE-ZXD	0		+70	°C
		SO-SFP-1000BASE-ZXD-I	-40		+85	
Power Supply Voltage	Vcc	3.15	3.3	3.45	V	
Power Supply Current	Icc			300	mA	
Data rate	GBE		1.25		Gbps	
	FC		1.063			

## PERFORMANCE SPECIFICATIONS – ELECTRICAL TRANSMITTER

Parameter	Symbol	Min	Typ	Max	Unit	Notes
LVPECL Inputs(Differential)	$V_{IN}$	500		2400	mVpp	AC coupled inputs
Input Impedance (Differential)	$Z_{IN}$	85	100	115	ohm	Rin > 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)	Vout	370		2000	mVpp	AC coupled outputs
Output Impedance (Differential)	Zout	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		80		km
Data Rate			1.063/1.25		Gbps

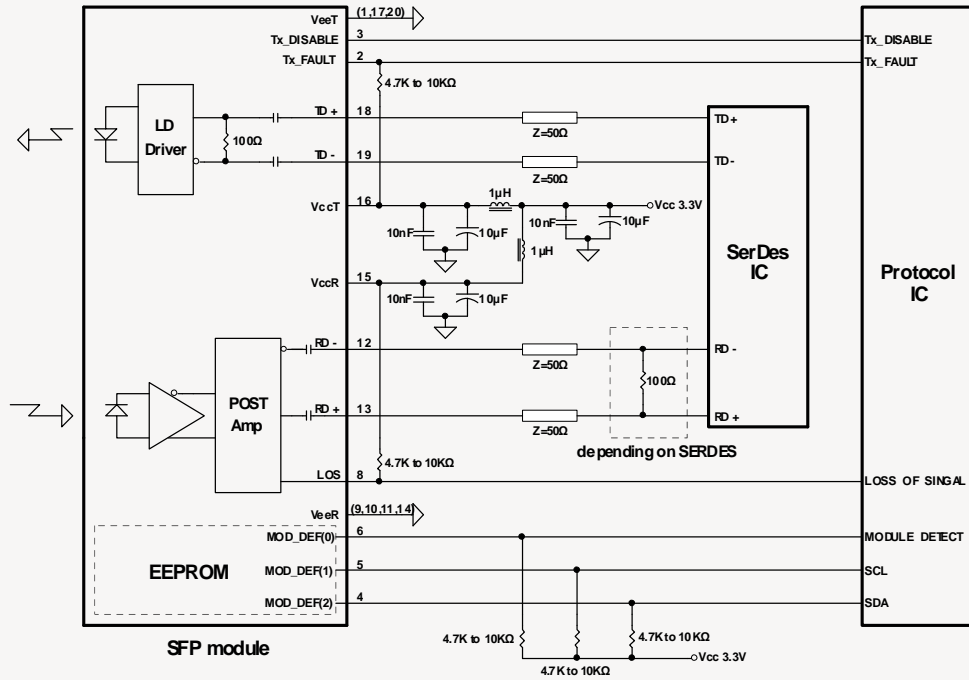
## OPTICAL AND ELECTRICAL CHARACTERISTICS TRANSMITTER

Parameter	Symbol	Min	Typ	Max	Unit
Centre Wavelength	$\lambda_c$	1500	1550	1580	nm
Spectral Width (RMS))	$\Delta\lambda$			1	nm
Side Mode Suppression Ratio	SMSR	30			dB
Average Output Power	$P_{out}$	0		5	dBm
Extinction Ratio	ER	9			dB
Rise/Fall Time(20%~80%)	$t_r/t_f$			0.26	ns
Total Jitter	TJ			0.43	UI
Output Optical Eye		Compliant with IEEE 802.3ah-2004			
TX Disable Assert Time	$t_{off}$			10	us
Pout@TX Disable Asserted	$P_{out}$			-45	dBm

## OPTICAL AND ELECTRICAL CHARACTERISTICS RECEIVER

Parameter	Symbol	Min	Typ	Max	Unit
Centre Wavelength	$\lambda$	1260		1600	nm
Receiver Sensitivity	$P_{min}$			-24	dBm
Receiver Overload	$P_{max}$	-3			dBm
Return Loss		12			dB
Optical Path Penalty				1	dB
LOS De-Assert	LOSD			-25	dBm
LOS Assert	LOSA	-38			dBm
LOS Hysteresis		0.5			dB

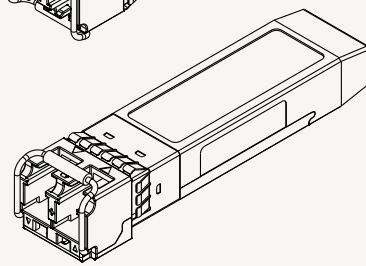
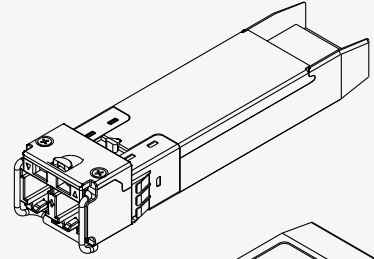
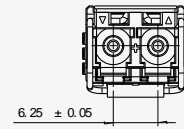
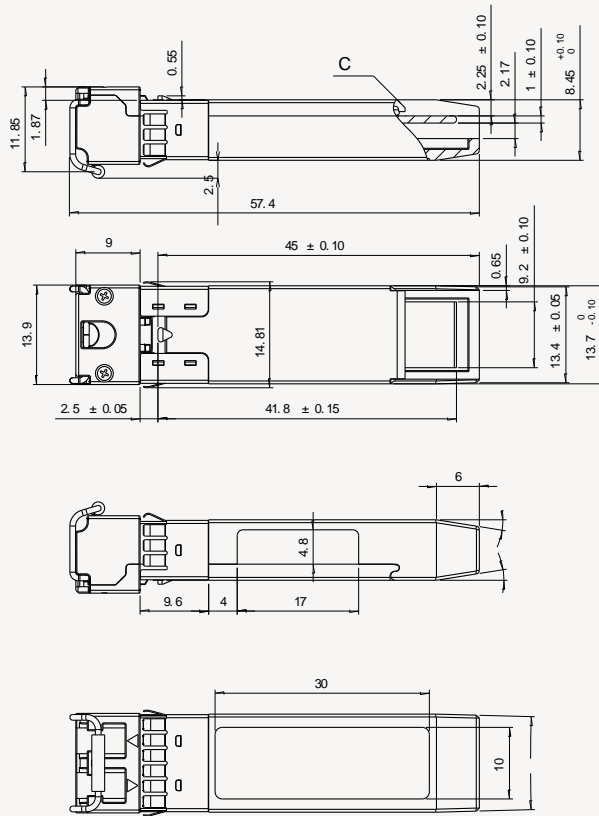
RECOMMENDED CIRCUIT SCHEMATIC



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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