

SO-SFP-8GFC-SD

SFP+, 8/4/2/1 Gbps FC/FICON, 850nm, MM, DDM, 5.1dB, 21m@OM1, 100m@OM2, 300m@OM3

OVERVIEW

The SO-SFP-8GFC-SD series multi-mode transceiver is small form factor pluggable module for duplex optical data communications such as 8x4x2x1x Fiber Channel and Gigabit Ethernet 1000BASE-SX. It is with the SFP 20-pin connector to allow hot plug capability. This module is designed for multi-mode fiber and operates at a nominal wavelength of 850 nm. The transmitter section uses a Vertical Cavity Surface Emitted Laser (VCSEL) and is a Class 1 laser compliant according to International Safety Standard IEC 60825. The receiver section uses an integrated GaAs detector preamplifier (IDP) mounted in an optical header and a limiting post-amplifier IC. The SO-SFP-8GFC-SD series are designed to be compliant with SFF-8472 Multi-source Agreement (MSA).

PRODUCT FEATURES

- Operating data rate up to 8.5Gbps
- 850nm VCSEL laser transmitter
- 300m with 50/125 μ m MMF
- 21m on 62.5/125 μ m MMF
- Single 3.3V power supply and TTL logic interface
- Hot-Pluggable SFP footprint duplex LC connector
- 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 SFF-8472 Digital Diagnostic Monitor (DDM) interface

APPLICATIONS

- 1.063/2.125/4.25Gbps fiber channel
- 1000Base-SX Ethernet
- Other optical links

ORDERING INFORMATION

Part Number	Description
SO-SFP-8GFC-SD	SFP+, 8/4/2/1 Gbps FC/FICON, 850nm, MM, DDM, 5.1dB, 21m@OM1, 100m@OM2, 300m@OM3
SO-SFP-8GFC-SD-I	SFP+, 8/4/2/1 Gbps FC/FICON, 850nm, MM, DDM, 5.1dB, 21m@OM1, 100m@OM2, 300m@OM3, 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	
Operating Case Temperature	T_c	SO-SFP-8GFC-SD	0		+70	°C
		SO-SFP-8GFC-SD -I	-40		+85	°C
Power Supply Voltage	Vcc	3.15	3.3	3.45	V	
Power Supply Current	Icc			300	mA	
Data rate	4xFC		8.5		Gbps	
	4xFC		4.25			
	OC-48		2.5			
	2xFC		2.125			
	GBE		1.25			
	FC		1.063			

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	Rin > 100 kohms @ DC
TX Disable	Disable	2		Vcc	V	
	Enable	0		0.8		
TX FAULT	Fault	2		Vcc+0.3	V	
	Normal	0		0.8		

PERFORMANCE SPECIFICATIONS – ELECTRICAL RECEIVER

Parameter	Symbol	Min	Typ	Max	Unit	Notes
CML Outputs (Differential)	V_{out}	400	800	1200	mVpp	AC coupled outputs
Output Impedance (Differential)	Z_{out}	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
OM3 MMF	8x/4x/2xFC		300		m
OM2 50µm Core	8xFC		75		
Diameter MMF	4xFC		150		m
	2xFC		300		
62.5µm Core	8xFC		21		
Diameter MM	4xFC		70		m
	2xFC		150		
Data Rate	8xFC		8.5		Gbps
	4xFC		4.25		
	2xFC		2.125		
	GBE		1.25		
	FC		1.063		

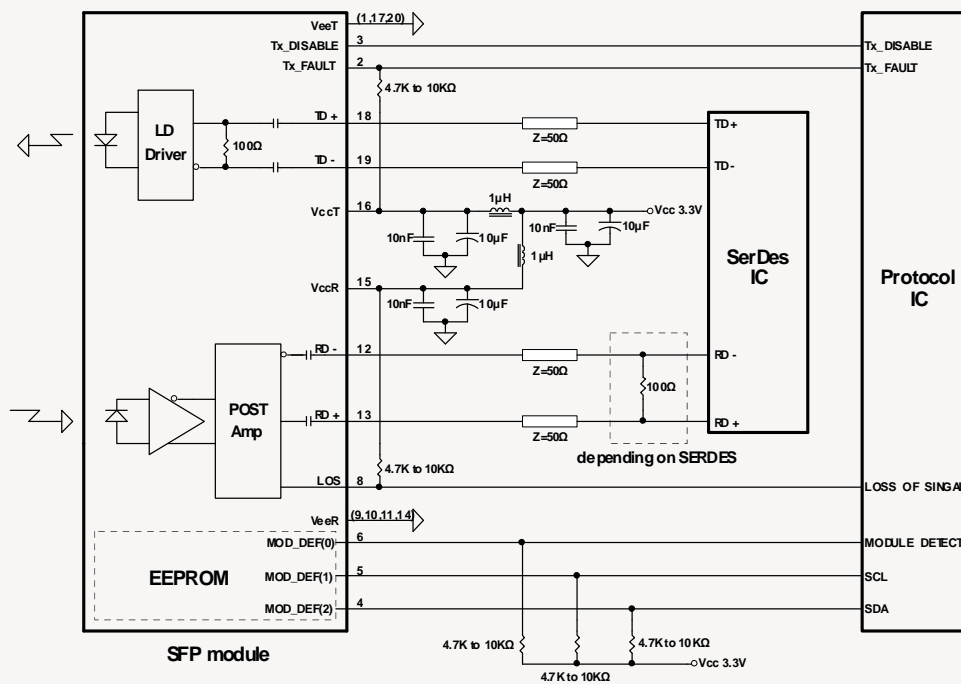
OPTICAL AND ELECTRICAL CHARACTERISTICS TRANSMITTER

Parameter	Symbol	Min	Typ	Max	Unit
Centre Wavelength	λ_c	830	850	860	nm
Spectral Width (RMS)	$\Delta\lambda$			0.85	nm
Average Output Power	P_{out}	-6		-1	dBm
Extinction Ratio @4.25Gb/s	ER	5			dB
Rise/Fall Time(20%~80%)	t_r/t_f			90	ps
Output Optical Eye		Complies with ANSI FC-PI specification			
TX Disable Assert Time	t_{off}			10	us

OPTICAL AND ELECTRICAL CHARACTERISTICS RECEIVER

Parameter	Symbol	Min	Typ	Max	Unit
Centre Wavelength	λ_c	760		860	nm
Receiver Sensitivity	8xFC P_{min}			-11.1	dBm
Receiver Overload	P_{max}	-3			dBm
Return Loss		12			dB
LOS De-Assert	LOSD			-16	dBm
LOS Assert	LOSA	-30			dBm
LOS Hysteresis		1			dB

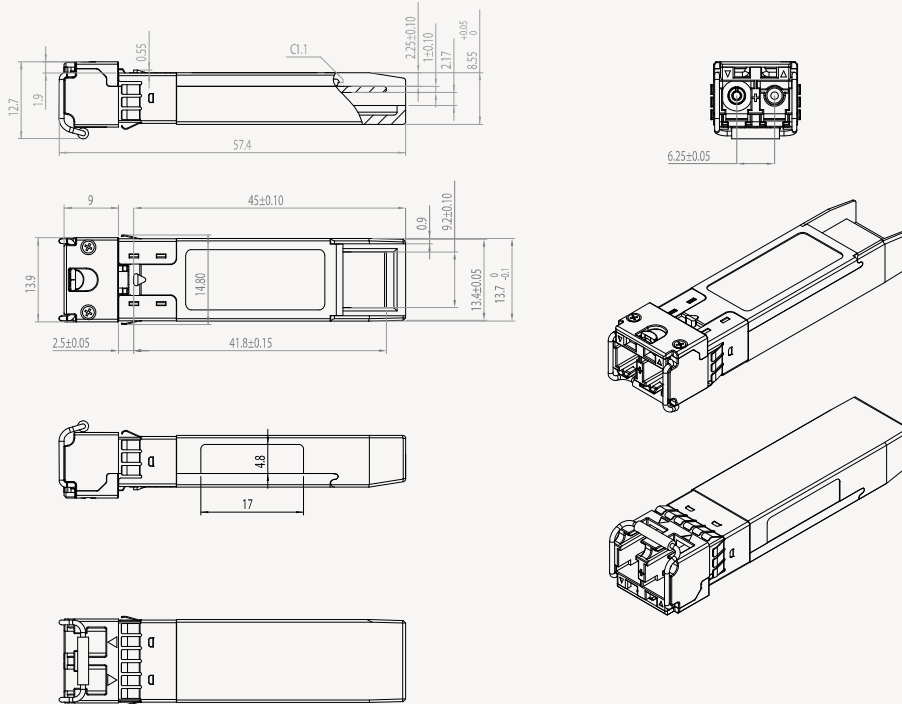
RECOMMENDED CIRCUIT SCHEMATIC



PIN FUNCTION DEFINITIONS

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 pulldown 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 pulldown 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 DRAWING



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