SO-SFP-1G-10G-SR

SFP+, 1/10GBase-SR, 850nm, MM, DDM, 7.5dB@1.25Gbps, 5.1dB@10.3Gbps , 300m

OVERVIEW

The SO-SFP-1G-10G-SR series multi-mode transceiver is SFP+ module with dual rate selectable for duplex optical data communications such as 1000BASE-SX, 10GBASE-SR and 10GBASE-SW and so on. It is with the SFP+ 20-pin connector to allow hot plug capability. Digital diagnostic functions are available via an I2C. 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 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.

PRODUCT FEATURES

- Supporting rate selectable 1.25Gbps or 9.95~10.3Gbps
- 850nm VCSEL transmitter
- Distance up to 300m @ 50/125 μm MMF
- Single 3.3V power supply and TTL logic interface
- Duplex LC connector interface,
- Hot-Pluggable
- Compliant with MSA SFP+ specification SFF-8431
- Compliant with IEEE 802.3ae 10GBASE-SR/SW
- Power dissipation < 1.0W
- Dispersion tolerance up to 40 ps/nm over G.651
- Operating case temperature
  - Standard: 0℃~+70℃
  - Extended: -10℃~+85℃

APPLICATIONS

- 10GBASE-SW at 9.953Gbps
- 10GBASE-SR at 10.3125Gbps
- 1000BASE-SX 1G Ethernet
- Other optical links

ORDERING INFORMATION

Part Number	Description
SO-SFP-1G-10G-SR	SFP+, 1/10GBase-SR, 850nm, MM, DDM, 7.5dB@1.25Gbps, 5.1dB@10.3Gbps , 300m
SO-SFP-1G-10G-SR-I	SFP+, 1/10GBase-SR, 850nm, MM, DDM, 7.5dB@1.25Gbps, 5.1dB@10.3Gbps , 300m, ind.temp

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	Vin		Vcc	V
Output Current	Io		50	mA

RECOMMENDED OPERATING CONDITIONS

Parameter		Symbol	Min	Typ	Max	Unit
Operating Case Temperature	*Tc*	*SO-SFP-1G-10G-SR*	0		+70	°C
		SO-SFP-1G-10G-SR -I	-10		+85	°C
Power Supply Voltage		*Vcc*	3.15	3.3	3.45	V
Power Supply Current		*Icc*			300	mA
Surge Current		*ISurge*			+30	mA
Data rate	10GBASE-SR			10.3		Gbps
	10GBASE-SW			9.95		
	1000BASE-SX			1.25		

PERFORMANCE SPECIFICATIONS – ELECTRICAL TRANSMITTER

Parameter		Symbol	Min	Typ	Max	Unit	Notes
CML Inputs(Differential)		V_{IN}	180		700	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)	*Vout*	300		850	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
50 / 125 um MMF			300		m
Data Rate	10GBASE-SW/SR	9.953		10.3	Gbps
	1000BASE-SX		1.25		

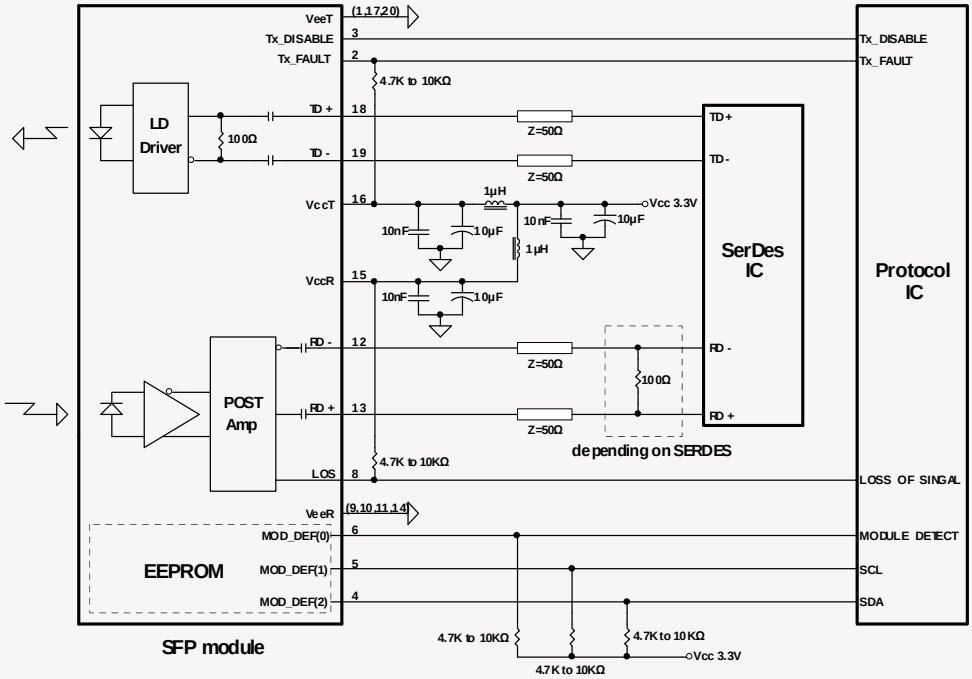
OPTICAL AND ELECTRICAL CHARACTERISTICS TRANSMITTER

Parameter		Symbol	Min	Typ	Max	Unit
Centre Wavelength		*λc*	840	850	860	nm
Spectral Width (RMS)		*Δλ*			0.45	nm
Average Output Power		*Pout@10.3Gbps*	-6		-1	dBm
		Pout@1.25Gbps	-9.5		-1	
Extinction Ratio		*ER@10.3Gbps*	3.0	5.0		dB
		ER@1.25Gbps	9			
Output Optical Eye				IEEE 802.3-2005 Compliant		
Transmitter Dispersion Penalty		*TDP*			3.9	dB
Input Differential Impedance		*Zin*	85	100	115	Ω
TX Disable	Disable		2.0		Vcc+0.3	V
	Enable		0		0.8	
TX_Fault	Fault		2.0		Vcc+0.3	V
	Normal		0		0.8	
TX_Disable Assert Time		*t_off*			10	us
TX_DISABLE Negate Time		*t_on*			2	ms
TX_BISABLE time to start reset		*t_reset*	10			us
Time to initialize, include reset of TX_FAULT		*t_init*			300	ms
TX_FAULT from fault to assertion		*t_fault*			100	us

OPTICAL AND ELECTRICAL CHARACTERISTICS RECEIVER

Parameter		Symbol	Min	Typ	Max	Unit
Centre Wavelength		*Λc*	840		860	nm
Receiver Sensitivity		*Pmin @10.3Gbps*			-11.1	dBm
		Pmin@1.25Gbps			-17	
Output Differential Impedance		*Zout*	85	100	115	Ω
Receiver Overload		P_{max}	-3			dBm
Optical Return Loss		*ORL*			-12	dB
LOS De-Assert		*LOSD@10.3Gbps*			-12.5	dBm
		LOSD@1.25Gbps			-18	
LOS Assert		*LOSA@10.3Gbps*	-25			dBm
		LOSA@1.25Gbps	-30			
LOS Hysteresis			0.5			dB
LOS	High		2.0		VCC+0.3	V
	Low		0		0.8	

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 (LVTTL). 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 (LVTTL). 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