



Fibre Optic Active

SFP+ SR Optical Transceiver

Small Form-Factor Pluggable (SFP+) Fibre Optic Transceivers are compact transceivers used to interface networking devices to fibre or copper networking cables in telecom and data applications.

We offer 4 types of SFP transceivers offering data rates up to 10Gbps and transmission distances up to 120km.

Features & Benefits

- SFP+ package with LC connector
- 850nm VCSEL Laser and PIN photo detector
- Up to 300m transmission on 2000MHz-km MMF
- Power dissipation < 1W
- LVPECL compatible data input/output interface
- Low EMI and excellent ESD protection
- laser safety standard IEC-60825 compliant
- Compatible with RoHS
- Compatible with SFF8472
- Suitable for;
 - Ethernet
 - Fibre Channel



Technical Specifications

Absolute Maximum Ratings

Parameters	Symbol	Min	Max	Unit
Supply Voltage	Vcc	0	+3.6	V
Storage Temperature	Tst	-40	+85	°C
Operating Humidity	RH	0	85	%

Recommended Operating Conditions

Parameters	Symbol	Min	Typical	Max	Unit
Operating Case Temperature (commercial)	Tc	-5		+70	°C
Power Supply Voltage	Vcc	3.15		3.45	V
Power Dissipation				1	W
Data Rate			10.3125		Gbps



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Optical and Electrical Characteristics

Transmitter					
Parameter	Symbol	Min	Typical	Max	Unit
Centre Wavelength	λ_0	840	850	860	nm
RMS Spectral Width	$\Delta\lambda$			0.45	dB
Average Output Power	P_o	-5		-1	dBm
Extinction Ratio	E_r	3.0			dB
Dispersion Penalty				3.9	dB
Relative Intensity Noise	RIN_{12OMA}			-128	dB/Hz
Total Jitter	T_j	IEEE 802.3ae			
Receiver					
Centre Wavelength	λ_0	850			nm
Receiver Sensitivity	R_{sen}			-11.5	dBm
Stressed Sensitivity	R_{sen}			7.5	dBm
Receiver Overload	R_{ov}	0			dBm
Return Loss		12			dBm
LOS Assert	LOS_A	-17			dBm
LOS De Assert	LOS_D			-16	dBm
LOS Hysteresis		0.5		4	

Electrical Characteristics

Transmitter					
Parameter	Symbol	Min	Typical	Max	Unit
Input Differential Impedance	Z_{in}	90	100	110	Ohm
Data Input Swing Differential	V_{in}	180		700	mV
TX Disable		2.0		V_{cc}	V
TX Enable		0		0.8	V
TX Fault Assert		2.0		V_{cc}	V
TX Fault De Assert		0		0.8	V
Receiver					
Output Differential Impedance	Z_{out}	100			Ohm
Data Output Swing Differential	V_{out}	300		800	mV
Rx LOS Assert		2.0		V_{cc}	V
Rx LOS De Assert		0		0.8	V

Diagnostics

Parameter	Range	Accuracy	Unit	Calibration
Temperature	-5 to +75	± 3	$^{\circ}C$	Internal
Voltage	0 to V_{CC}	0.1	V	Internal
Bias Current	0 to 120	0.5	mA	Internal
TX Power	0 to 5	± 1	dB	Internal
RX Power	-25 to -3	± 1	dB	Internal



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EEPROM Information

Address	Field Size (Bytes)	Name Of Field	HEX	Description
0	1	Identifier	03	SFP
1	1	Ext. Identifier	04	MOD4
2	1	Connector	07	LC
3-10	8	Transceiver	10 00 00 00 00 00 00	Transmitter Code
11	1	Encoding	06	64B66B
12	1	BR, Nominal	67	10000M bps
13	1	Reserved	00	
14	1	Length (9um)-km	00	
15	1	Length (9um)	00	
16	1	Length (50um)	08	
17	1	Length (62.5um)	02	
18	1	Length (Copper)	00	
19	1	Reserved	00	
20-35	16	Vendor Name	57 49 4E 54 4F 50 20 20 20 20 20 20 20 20 20 20	WINTOP
36	1	Reserved	00	
37-39	3	Vendor OUI	00 00 00	
40-55	16	Vendor PN	Xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx	ASCII
56-59	4	Vendor Rev	31 2E 30 20	V1.0
60-61	2	Wavelength	05 1E	1310nm
62	1	Reserved	00	
63	1	CC BASE	xx	Check sum of byte 0 to 62
64-65	2	Options	00 1A	LOS, TX_DISABLE TX_FAULT
66	1	BR, Max	00	
67	1	BR, Min	00	
68-83	16	Vendor SN	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	Unspecified
84-91	8	Vendor Date Code	Xx xx xx 20	Year, Month, Day
92-94	3	Reserved	00	
95	1	CC_EXT	xx	Check Sum Of Byte 64 to 94
96-255	160	Vendor Specific		



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Pin Description

Pins	Name	Description	Note
1	VeeT	Transmitter Ground	
2	Tx Fault	Transmitter Fault Indication	1
3	Tx Disable	Transmitter Disable	2
4	MOD DEF2	Module Definition 2	3
5	MOD DEF1	Module Definition 1	3
6	MOD DEF0	Module Definition 0	3
7	RS0	Not Connected	
8	LOS	Loss Of Signal	4
9	RS1	Not Connected	
10	VeeR	Receiver Ground	
11	VeeR	Receiver Ground	
12	RD-	Inv. Received Data Output	5
13	RD+	Inv. Received Data Output	5
14	VeeR	Receiver Ground	
15	VccR	Receiver Power	
16	VccT	Transmitter Power	
17	VeeT	Transmitter Ground	
18	TD+	Transmitter Data Input	6
19	TD-	Inv. Transmitter Data Input	6
20	VeeT	Transmitter Ground	

Notes:

TX Fault is an open collector output, which should be pulled up with a 4.7k~10kΩ resistor on the host board to a voltage between 2.0V and Vcc+0.3V. Logic 0 indicates normal operation; logic 1 indicates a laser fault of some kind. In the low state, the output will be pulled to less than 0.8V.

TX Disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with a 4.7k~10kΩ resistor. Its states are:

Low (0~0.8V): Transmitter on

(>0.8V, <2.0V): Undefined

High (2.0~3.465V): Transmitter Disabled

Open: Transmitter Disabled

MOD-DEF 0, 1, 2 are the module definition pins. They should be pulled up with a 4.7k~10kΩ resistor on the host board. The pull-up voltage shall be VccT or VccR.

MOD-DEF 0 is grounded by the module to indicate that the module is present

MOD-DEF 1 is the clock line of two wire serial interface for serial ID

MOD-DEF 2 is the data line of two wire serial interface for serial ID



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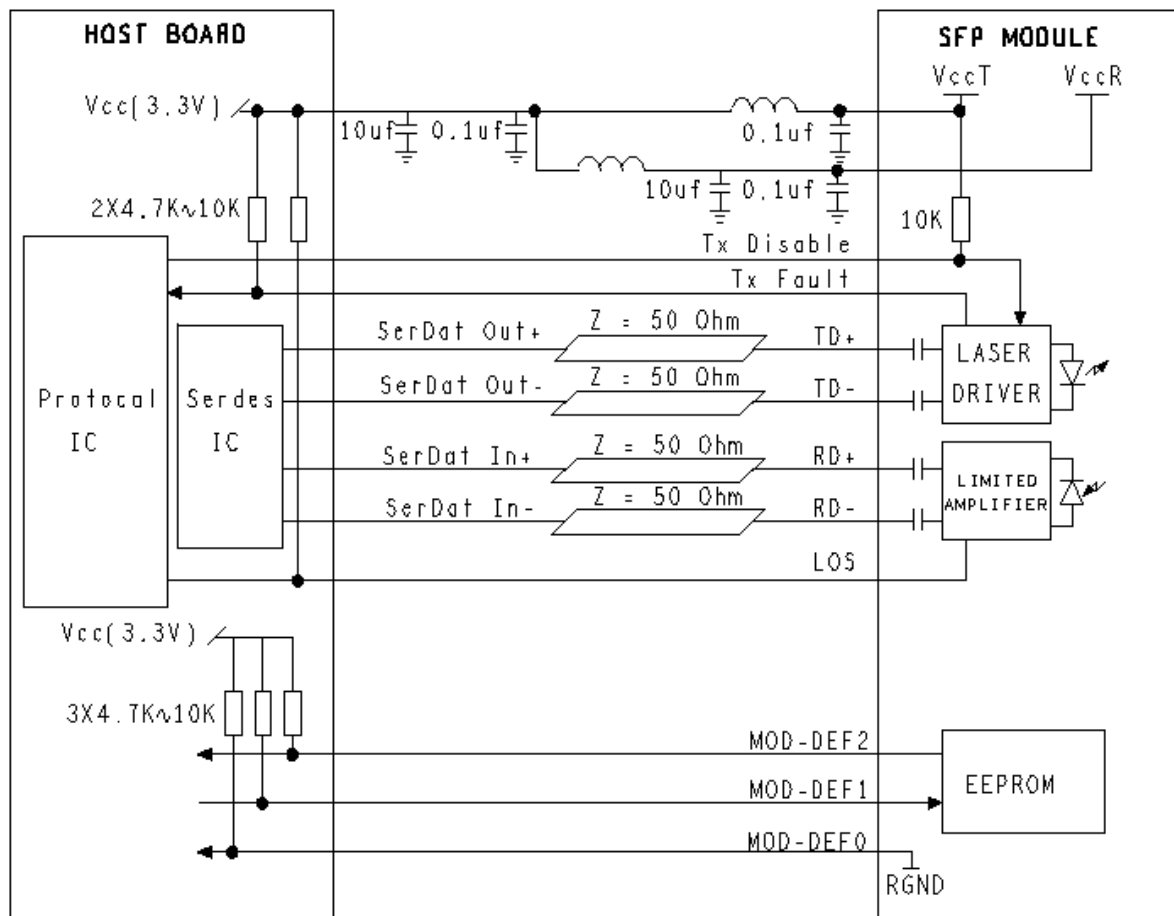
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LOS is an open collector output, which should be pulled up with a 4.7k~10kΩ resistor on the host board to a voltage between 2.0V and Vcc+0.3V. Logic 0 indicates normal operation; logic 1 indicates loss of signal. In the low state, the output will be pulled to less than 0.8V.

These are the differential receiver output. They are internally AC-coupled 100Ω differential lines which should be terminated with 100Ω (differential) at the user SERDES.

These are the differential transmitter inputs. They are AC-coupled, differential lines with 100Ω differential termination inside the module.

Recommended Application Circuit

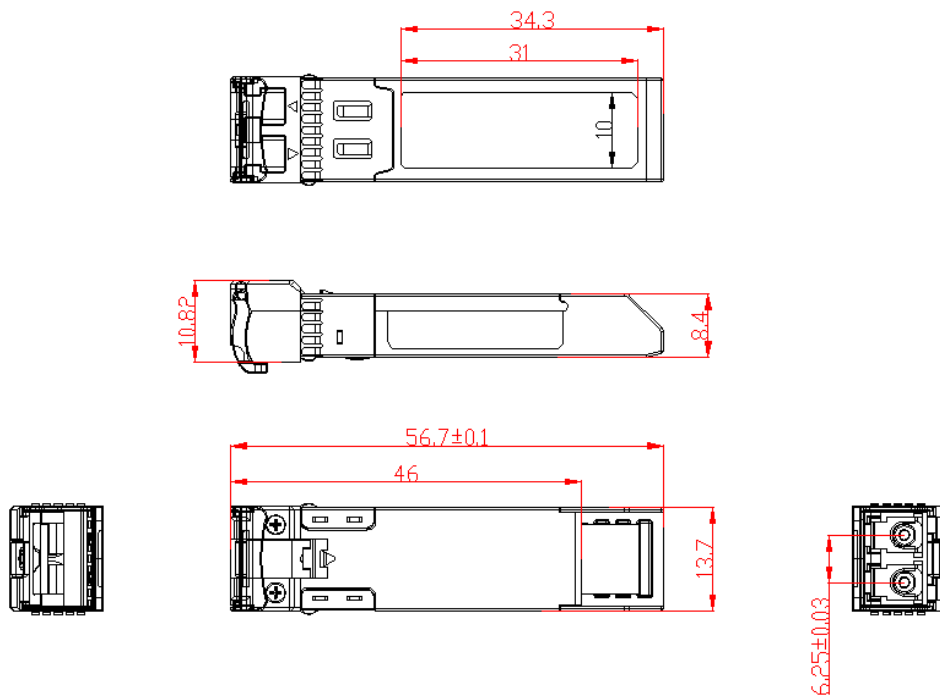




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Technical Drawings



Ordering Information

Using the available configurations amend/create a part number using the formula below.

Transceiver Type / Data Rate		Transmission Distance	
SFP+/10Gbps SFPP10		550m (Multimode Only)	550
SFPP10	MM	550	CIS
Fibre Type		Coding	
Multimode MM		Cisco	CIS
		HP	HP
		Juniper	JNP

Example: **SFPP10MM550CIS** - 10Gbps Multimode 550m SFP+ with Cisco Coding