

SP10-MM850SRx

SFP+ 10Gb/s 850nm 300m Transceiver

PRODUCT FEATURES

- SFP+ Hot pluggable
- LC Duplex optical interface
- 850nm VCSEL transmitter, PIN receiver
- Compliant with SFP+ MSA SFF-8431, SFF-8432
- Low power consumption
- All-metal housing for superior EMI performance
- Advanced firmware allows encryption
- RoHS compliant
- Operating case temperature:

Commercial: 0 to 70 °C

Industrial: -40 to 85 °C



APPLICATIONS

- 10GBASE-SR/SW

PRODUCT DESCRIPTION

Photonics Valley's SP10-MM850SRx SFP+ 10Gbps transceiver is designed to transmit and receive optical data over multi-mode optical fiber for link length 300m, its electrical interface is compliant to SFI electrical specifications. The transmitter input and receiver output impedance is 100 Ohms differential. Data lines are internally AC coupled. The module provides differential termination and reduce differential to common mode conversion for quality signal termination and low EMI.

Ordering information

Product part Number	Data Rate (Gbps)	Media	Wavelength (nm)	Transmission Distance(km)	Temperature Range	
					T _{case} / °C	
SP10-SM31LR10C	10.3	SMF	1310	10	0~70	Commercial
SP10-SM31LR10I	10.3	SMF	1310	10	-40~85	Industrial

Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit
Power Supply Voltage	V _{CC}	-0.5		4	V
Storage Temperature Range	T _S	-40		85	°C
Relative Humidity - Storage	RH _S	0		95	%
Relative Humidity - Operating	RH _O	0		85	%

Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit
Case Operating Temperature Range	T _C	0	-	70	°C
		-40	-	85	
Power Supply Voltage	V _{CC}	3.14	3.3	3.46	V
Supply Current	I _{CC}	-	-	300	mA
Data Rate	BR	-	10.3125	-	Gbps

Electrical Interface Characteristics

Parameter	Symbol	Min	Typ	Max	Unit
Transmitter					
Differential Input Voltage Swing	V _{IN}	180	-	700	mV
Tx Differential Input Impedence	Z _{IN}	-	100	-	Ω
Transmitter Disable Voltage	V _{DIS}	2.0	-	V _{CC} +0.3	V
Transmitter Enable Voltage	V _{EN}	0	-	0.8	V
T _{FAULT} Logic High	V _{TFH}	2.4	-	V _{CC}	V
T _{FAULT} Logic Low	V _{TFL}	V _{EE}	-	V _{EE} +0.4	V
Receiver					
Differential output Voltage Swing	V _{OUT}	300	-	850	mV
Rx Differential Output Impedence	Z _{OUT}	-	100	-	Ω
LOS Assert Voltage	V _{LOSA}	2.4	-	V _{CC}	V
LOS De-assert Voltage	V _{LOSD}	V _{EE}	-	V _{EE} +0.4	V

Optical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Transmitter						
Laser Type		VCSEL				
Center Wavelength Range	λ	840	850	860	nm	
RMS Spectral Width	$\Delta\lambda$	-	-	0.45	nm	
Average Launch power of OFF transmitter	P _{OFF}	-	-	-30	dBm	
Launch Optical Power	P _{out}	-7.3	-	-1	dBm	1
Extinction Ratio	ER	3.0	-	-	dB	
Relative Intensity Noise	RIN	-	-	-128	dB/Hz	
Optical Return Loss Tolerance		-	-	12	dB	
Transmitter and Dispersion Penalty	TDP	-	-	3.9	dB	
Eye Diagram	Complies with IEEE802.3ae eye masks when filtered					
Receiver						
Receiver Type		PIN				
Operating Central Wavelength	λ	840	850	860	nm	
Receiver Sensitivity (OMA)	Sen	-	-	-11.1	dBm	2
Receiver Overload	P _{SAT}	0.5	-	-	dBm	
Receiver Reflectance	RFL	-	-	-12	dB	
LOS Assert	LOSA	-30	-	-	dBm	
LOS De-Assert	LOSD	-	-	-12	dBm	
LOS Hysteresis	LOSH	0.5	3	5	dB	
Notes						
1. Average power figures are informative only, per IEEE 802.3ae.						
2. Measured with 2 ³¹ -1 PRBS@10.3125Gbps, BER<10 ⁻¹²						

Pin Description

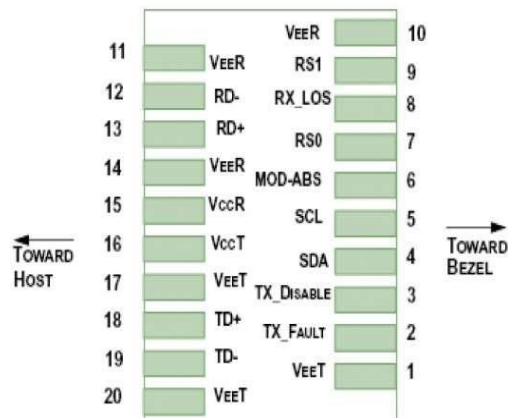
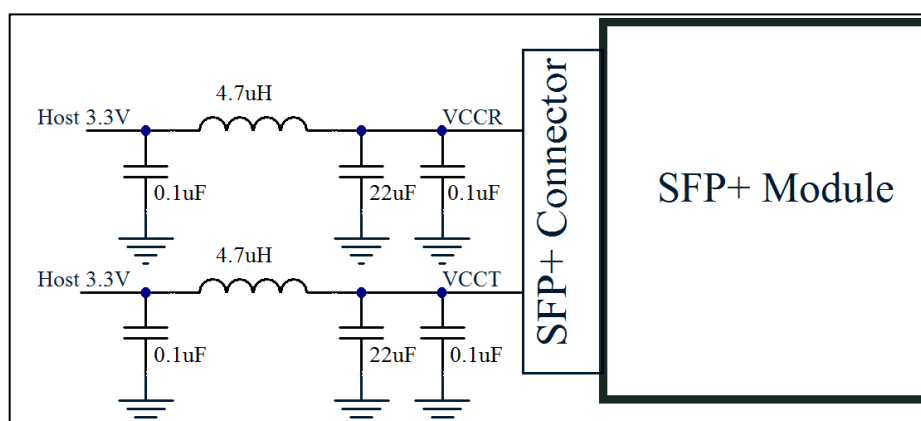


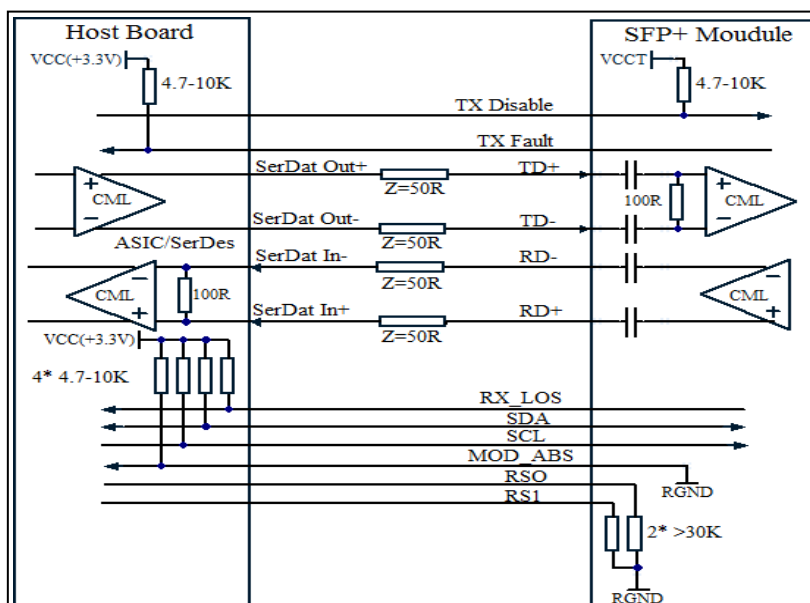
Diagram of Host Board Connector Block Pin Numbers and Name

Pin	Symbol	Description	Notes
1	VEET	Transmitter Ground	1
2	TFAULT	Transmitter Fault	2
3	TDIS	Transmitter Disable. Laser output disabled on high or open	3
4	SDA	2-wire Serial Interface Data Line	2
5	SCL	2-wire Serial Interface Clock Line	2
6	MOD_ABS	Module Absent. Grounded within the module	
7	RS0	Rate Select 0. Not Used.	4
8	RX_LOS	Loss of Signal indication. Logic 0 indicates normal operation	2
9	RS1	Rate Select 1. Not Used.	4
10	VEER	Receiver Ground	1
11	VEER	Receiver Ground	1
12	RD-	Receiver Inverted DATA out. AC Coupled.	
13	RD+	Receiver Non-inverted DATA out. AC Coupled.	
14	VEER	Receiver Ground	1
15	VCCR	Receiver Power Supply	
16	VCCT	Transmitter Power Supply	
17	VEET	Transmitter Ground	1
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled.	
19	TD-	Transmitter Inverted DATA in. AC Coupled.	
20	VEET	Transmitter Ground	1
Notes			
1. Circuit ground is internally isolated from chassis ground. 2. Shall be pulled up with 4.7k-10k Ohms to a voltage between 3.15V and 3.6V on the host board. 3. Laser output disabled on $T_{DIS} > 2.0V$ or open, enabled on $T_{DIS} < 0.8V$. 4. Internally pulled down per SFF-8431 Rev 4.1.			

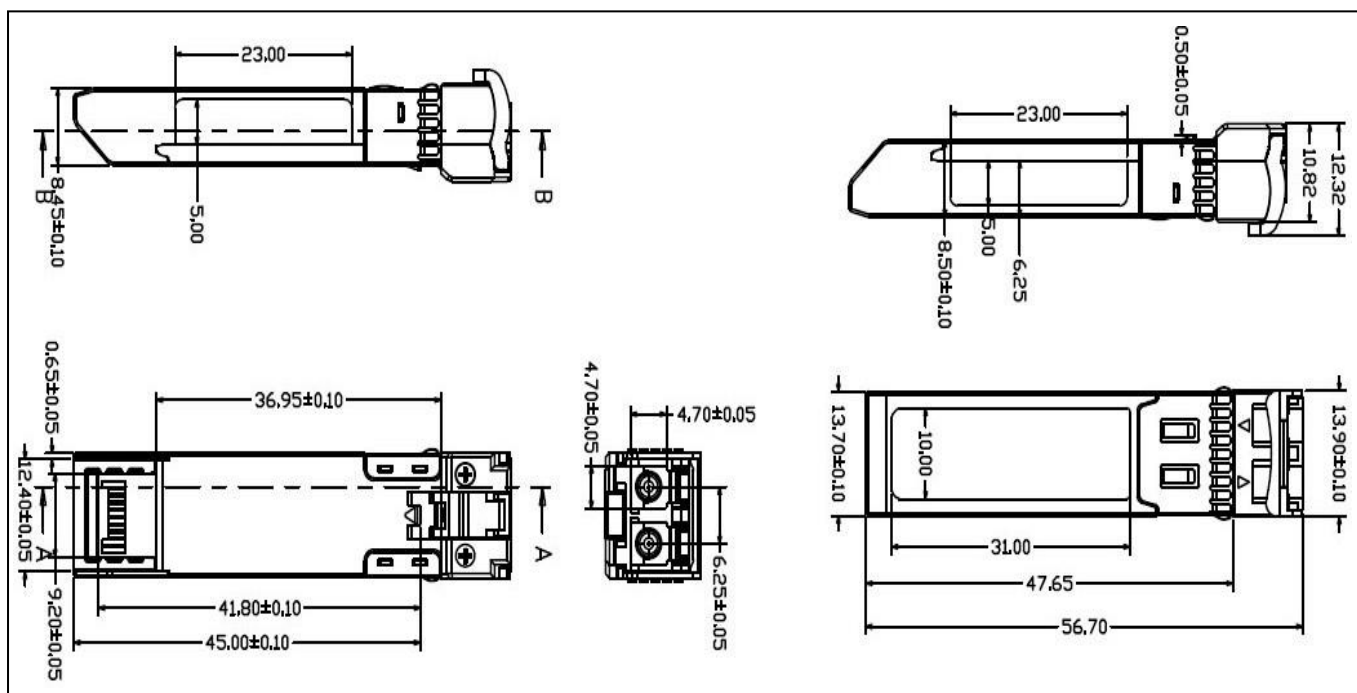
★ Recommended Host Board Supply Filtering Circuit



Recommended Interface Circuit



Mechanical Dimensions



Regulatory Compliance

Feature	Reference	Performance
Electrostatic discharge (ESD)	IEC/EN 61000-4-2	Compatible with standards
Electromagnetic Interference (EMI)	FCC Part 15 Class B EN 55022 Class B (CISPR 22A)	Compatible with standards
Laser Eye Safety	IEC/EN 60825-1, 2	Class 1 laser product
ROHS	2002/95/EC	Compatible with standards
EMC	EN61000-3	Compatible with standards