

SP28-MM850SRx

SFP28 25Gb/s 850nm 100m Transceiver

PRODUCT FEATURES

- Supports 25.78Gb/s bit rate
- 850nm VCSEL laser and PIN photo-detector
- Up to 70m on OM3 and 100m OM4
- Digital diagnostics functions
- +3.3V single power supply
- Power consumption <1W
- RoHS compliant
- Operating case temperature:

Commercial: 0°C to +70°C
Industrial: -40°C to +85°C



APPLICATIONS

- 25GBASE-SR
- 32G Fiber Channel
- Data center interconnection

PRODUCT DESCRIPTION

The SP28-MM850SRx is SFP28 module for duplex optical data communications support 25.78 Gb/s and 28.05 Gb/s data links. 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 850nm.

Ordering information

Part Number	Data Rate (Gbps)	Media	Wavelength (nm)	Transmission Distance(km)	Temperature Range (Tcase) (°C)	
SP28-MM850SRC	25.78	MMF	850	70m @ OM3 100m @ OM4	0~70	Commercial
SP28-MM850SRI	25.78	MMF	850	70m @ OM3 100m @ OM4	-40~85	Industrial

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Supply Voltage	Vcc ₃	-0.5	-	+3.6	V	
Storage Temperature	T _s	-40	-	+85	°C	
Operating Humidity	RH	+5	-	+85	%	1

Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Operating Case Temperature	T _c	0	-	+70	°C	
	T _c	-40	-	+85	°C	
Power Supply Voltage	Vcc	3.14	3.3	3.47	V	
Power Supply Current	Icc	-	-	300	mA	
Power Dissipation	Pd	-	-	1.0	W	
Bit Rate	BR	8.5	25.78125	-	Gbps	

Optical Characteristics

Parameter	Symbol	Unit	Min	Typ	Max	Notes
Transmitter						
Bit Rate	BR	Gbps	8.5	25.78125	-	1
Center Wavelength Range	λ _c	nm	820	850	880	
Average Launch power Tx_off	P _{off}	dBm	-	-	-45	
Average Optical Power	P ₀	dBm	-5.0		2.4	2

Extinction Ratio	ER	dB	2.0	-	-	
Optical Eye Mask	-	%	5	-	-	
Receiver						
Bit Rate	BR	Gbps	8.5	25.78125	-	1
Sensitivity@BER=5E-5	BER	dBm	-	-	-10.3	3
Sensitivity@BER=1E-12	BER	dBm	-	-	-5.2	3
Overload Input Optical Power	P _{IN}	dBm	2.4	-	-	3
Center Wavelength Range	λ_c	nm	820	-	880	

Note:

- 1) Set low of RS0/RS1 pin and 0 of RS0/RS1 bit. Engine CDR lock at low bit rate. Set high of RS0/RS1 pin and 0 of RS0/RS1 bit. Engine CDR lock at high bit rate.
- 2) Coupled into 50/125 MMF.
- 3) Measured with PRBS 231-1 test pattern @25.78125Gbps.

Electrical Interface Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Units	Notes
Transmitter							
Differential Data Input Swing		V _{in,P-P}	200	-	1600	mV _{PP}	
Input Differential Impedance		Z _{IN}	90	100	110	Ω	
Tx_Fault	Normal Operation	V _{OL}	0	-	0.8	V	
	Transmitter Fault	V _{OH}	2.0	-	V _C	V	
Tx_Disable	Normal Operation	V _{IL}	0	-	0.8	V	
	Laser Disable	V _{IH}	2.0	-	V _{CC} +0.3	V	
Receiver							
Differential Data Output		V _{out}	400	-	800	mV	
Output Differential Impedance		Z _D	90	100	110	ohms	
Rx_LOS	Normal Operation	V _{OL}	0	-	0.8	V	
	Lose Signal	V _{OH}	2.0	-	V _{CC}	V	

Pin Description

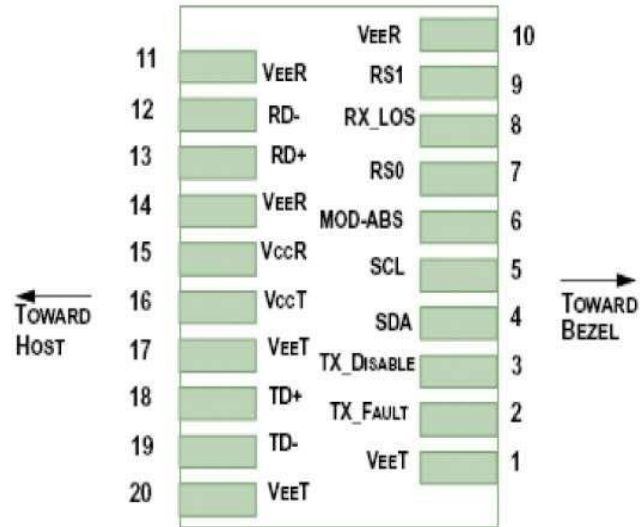


Diagram of Host Board Connector Block Pin Numbers and Name

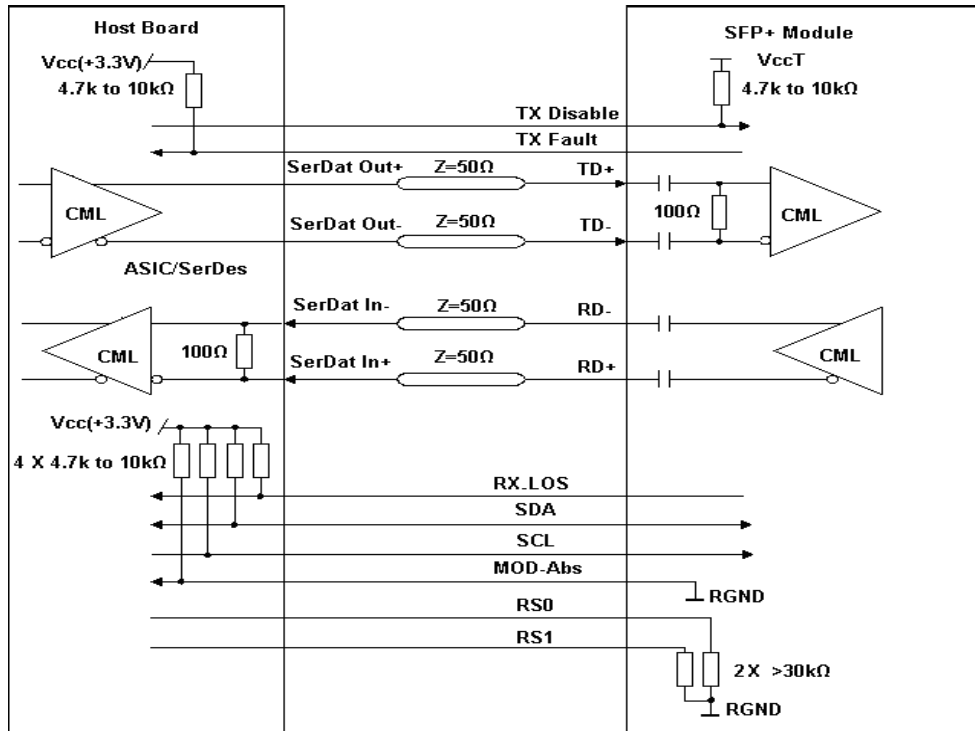
Pin	Symbol	Name/Description	NOTE
1	V_{EET}	Transmitter Ground (Common with Receiver Ground)	1
2	T_{FAULT}	Transmitter Fault.	2
3	T_{DIS}	Transmitter Disable. Laser output disabled on high or open.	3
4	SDA	2-wire Serial Interface Data Line	4
5	SCL	2-wire Serial Interface Clock Line	4
6	MOD_ABS	Module Absent. Grounded within the module	4
7	RS0	Rate Select 0, internal pull down	5

Pin	Symbol	Name/Description	NOTE
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation.	6
9	RS1	Rate Select 1, internal pull down	5
10	V _{EER}	Receiver Ground (Common with Transmitter Ground)	1
11	V _{EER}	Receiver Ground (Common with Transmitter Ground)	1
12	RD-	Receiver Inverted DATA out. AC Coupled	
13	RD+	Receiver Non-inverted DATA out. AC Coupled	
14	V _{EER}	Receiver Ground (Common with Transmitter Ground)	1
15	V _{CCR}	Receiver Power Supply	
16	V _{CCT}	Transmitter Power Supply	
17	V _{EET}	Transmitter Ground (Common with Receiver Ground)	1
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled.	
19	TD-	Transmitter Inverted DATA in. AC Coupled.	
20	V _{EET}	Transmitter Ground (Common with Receiver Ground)	1

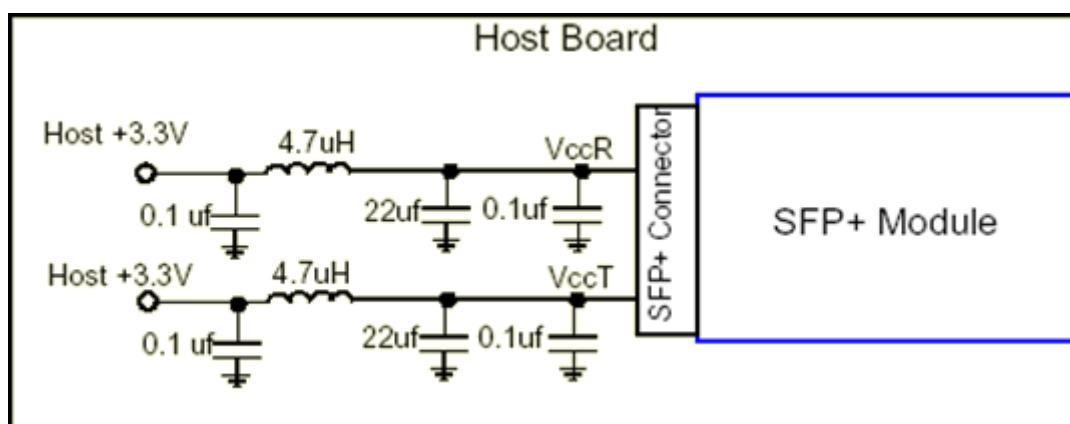
Notes:

1. Circuit ground is internally isolated from chassis ground.
2. T_{FAULT} is an open collector/drain output, which should be pulled up with a 4.7k – 10k Ohms resistor on the host board if intended for use. Pull up voltage should be between 2.0V to V_{cc} + 0.3V. A high output indicates a transmitter fault caused by either the TX bias current or the TX output power exceeding the preset alarm thresholds. A low output indicates normal operation. In the low state, the output is pulled to <0.8V.
3. Laser output disabled on T_{DIS}>2.0V or open, enabled on T_{DIS}<0.8V.
4. Should be pulled up with 4.7kΩ- 10kΩ host board to a voltage between 2.0V and 3.6V. MOD_ABS pulls line low to indicate module is plugged in.
5. Rate select can also be set through the 2-wire bus in accordance with SFF-8472. Rx Rate Select is set at Bit 3, Byte 110, Address A2h. Tx Rate Select is set at Bit 3, Byte 118, Address A2h.
6. LOS is open collector output. It should be pulled up with 4.7kΩ – 10kΩ on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

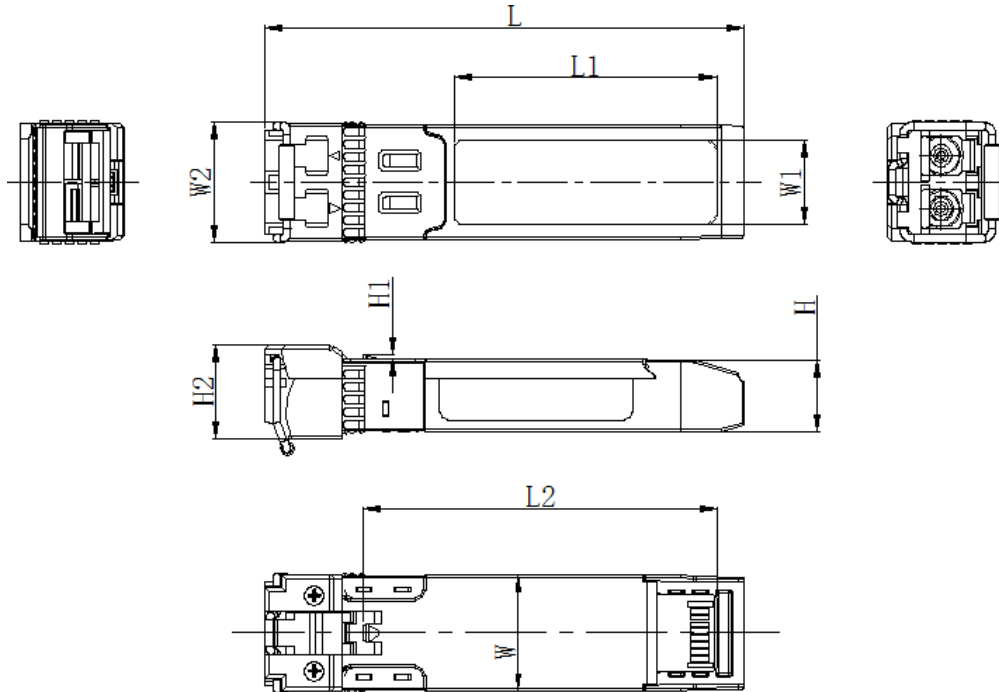
Recommended Interface Circuit



Recommended Filter for Voltage Supply



Mechanical Dimensions



Unit: mm

	L	L1	L2	W	W1	W2	H	H1	H2
MAX	56.9	31.2	41.95	13.8	10.2	14.5	8.7	0.55	11.5
Typical	56.7	31.0	41.80	13.7	10.0	14.3	8.6	0.5	11.3
MIN	56.5	30.8	41.65	13.6	9.8	14.1	8.5	0.45	11.1

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
Component Recognition	IEC/EN 60950, UL	Compatible with standards
ROHS	2002/95/EC	Compatible with standards
EMC	EN61000-3	Compatible with standards