

## 25GBase-SR 70m SFP28 Transceiver

### ESTRSCS003

#### Product Features

- Up to 25.78Gb/s bi-directional data links
- Electrical interface specification per SFF-8431
- Management interface specifications per SFF-8432 and SFF-8472
- Built-in dual CDR with shut off control
- SFP28 MSA package with duplex LC connector
- Uncooled 850nm VCSEL laser
- Up to 70m on OM3 MMF and 100m on OM4 MMF
- +3.3V power supply

#### Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage temperature	T <sub>s</sub>	-40	85	°C
Supply voltage	V <sub>CC3</sub>	-0.5	4	V
Relative humidity	RH	5	95	%

#### Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Operating case temperature	T <sub>c</sub>	0	25	70	°C	Commercial
Operating case temperature	T <sub>c</sub>	-40	25	85	°C	Industrial
Power supply voltage	V <sub>CC3</sub>	3.135	3.3	3.465	V	
Data rate			24.33 25.78	28	Gbps	

## Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Module supply current	I <sub>CC</sub>			290	mA	
Power dissipation	P <sub>D</sub>			1000	mW	Commercial
	P <sub>D</sub>			1200	mW	Industrial
<b>Transmitter</b>						
Input differential impedance	Z <sub>IN</sub>		100		Ω	
Differential data input swing	V <sub>IN,P-P</sub>	180		700	mV <sub>P-P</sub>	
TX_fault, transmitter fault	V <sub>OH</sub>	2.0		V <sub>CCHOST</sub>	V	
TX_fault, normal operation	V <sub>OL</sub>	0		0.8	V	
TX_disable, transmitter disable	V <sub>IH</sub>	2.0		V <sub>CCHOST</sub>	V	
TX_disable, transmitter enable	V <sub>IL</sub>	0		0.8	V	
<b>Receiver</b>						
Output differential impedance	Z <sub>O</sub>		100		Ω	
Differential data output swing	V <sub>OUT,P-P</sub>	300		850	mV <sub>P-P</sub>	1
Data output rise time, fall time	t <sub>r</sub> , t <sub>f</sub>	15	30		ps	2
RX_LOS, loss of signal (LOS)	V <sub>OH</sub>	2.0		V <sub>CCHOST</sub>	V	3
RX_LOS, normal operation	V <sub>OL</sub>	0		0.8	V	3

### Notes:

1. Internally AC coupled, but requires a external 100Ω differential load termination
2. 20%~80%
3. LOS is an open collector/drain output. Should be pulled up with 4.7kΩ~10kΩ on the host.

## Optical Characteristics

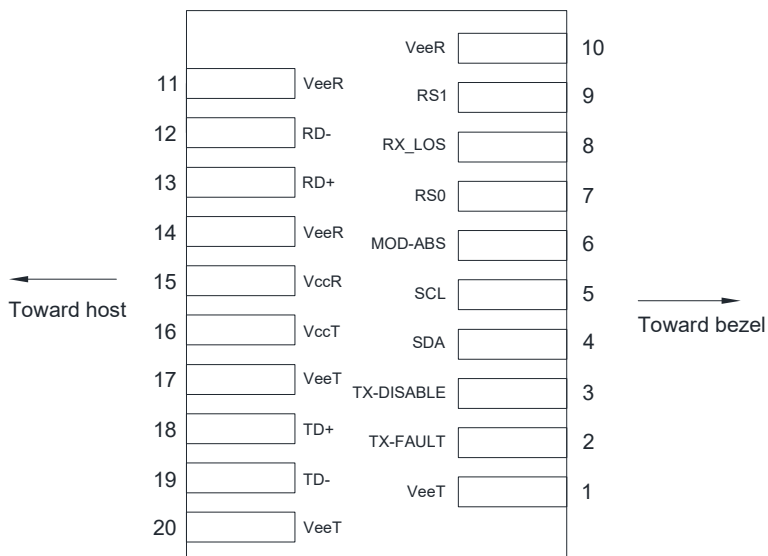
Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
<b>Transmitter</b>						
Launch optical power	P <sub>o</sub>	-5		2.4	dBm	1
Extinction ratio	ER	2			dB	
Center wavelength	λ <sub>c</sub>	840	850	860	nm	
Optical modulation amplitude	OMA	275		3000	uW	2
Transmitter and dispersion penalty	TDP			4.3	dB	
Special width	Δλ			0.6	Nm	
Optical return loss tolerance	ORLT			12	dB	
Pout @TX_disable asserted	P <sub>off</sub>			-30	dBm	1
Eye diagram	ITU-T G.691 SDH STM-64 I-64.1 compatible					

Receiver						
Center wavelength	$\lambda_c$	840	850	860	nm	
Receiver OMA sensitivity	RxSENS			-10.3	dBm	3
Receiver overload (Pavg)	Pol	2.5			dBm	
Optical return loss	ORL	12			dB	
LOS de-assert	LOSD			-12	dBm	
LOS assert	LOSA	-30			dBm	
LOS hysteresis		0.5			dB	

Note:

1. 50/125um fiber with NA=0.2, 62.5/125um fiber with NA=0.275.
2. Even if the TDP<0.9dB, the OMA(min) must exceed this value.
3. Measured with PRBS 231-1 at 10-5 BER @25.78Gb/s

## Pin Descriptions



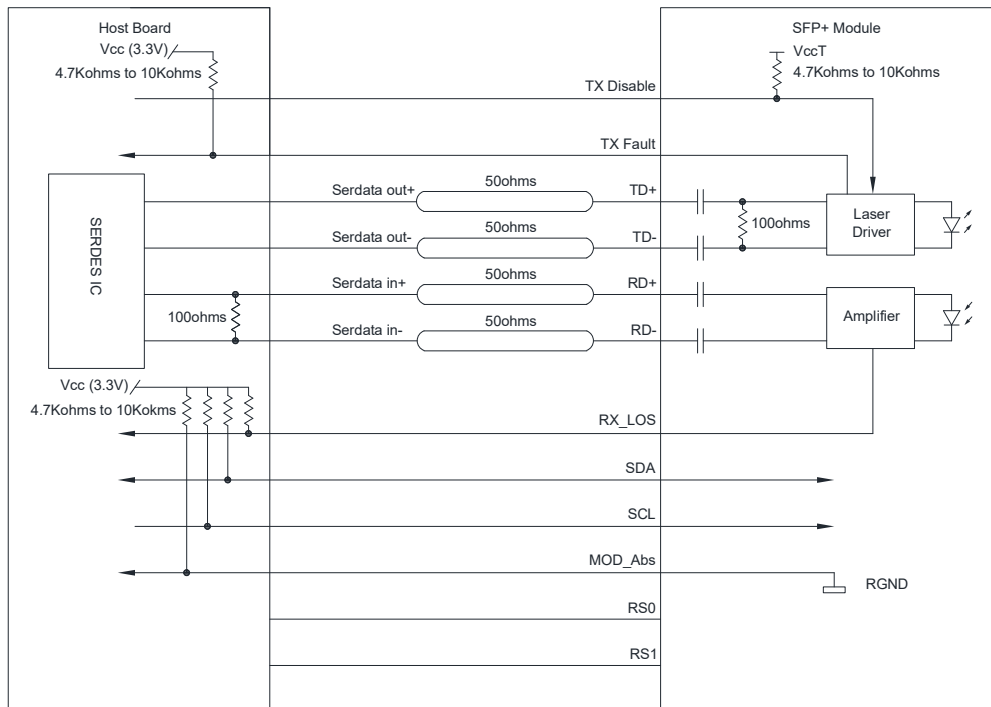
Pin	Symbol	Descriptions	Note
1	VeeT	Transmitter ground	1
2	TX_fault	Transmitter fault (LVTTTL-O) – high indicates a fault condition	2
3	TX_disable	Transmitter disable (LVTTTL-I) – high or open disable the transmitter	3
4	SDA	2-wire serial interface data line (LVCMOS-I/O) (MOD-DEF2)	4
5	SCL	2-wire serial interface clock line (LVCMOS-I/O) (MOD-DEF1)	4

6	MOD_ABS	Module absent, (output), connected to VeeT or VeeR in the module	5
7	RS0	NA	6
8	RX_LOS	Receiver loss of signal LVTTL-O)	2
9	RS1	NA	6
10	VccRx	Receiver ground	1
11	SCL	Receiver ground	1
12	RD-	Inverse received data out (CML-O)	
13	RD+	Received data out (CML-O)	
14	VeeR	Receiver ground	
15	VccR	Receiver power +3.3V	
16	VccT	Transmitter power +3.3V	
17	VeeT	Transmitter ground	1
18	TD+	Transmitter data in (CML-I)	
19	TD-	Reverse transmitter data in (CML-I)	
20	VeeT	Transmitter ground	1

Note:

1. The module signal ground pins, VeeR and VeeT, shall be isolated from the module case
2. This pin is an open collect/drain output pin and shall be pulled up with 4.7k-10kohms to Host Vcc on the host board. Pull ups can be connected to multiple power supplies. However the host board design shall ensure that no module pin has voltage exceeding module VccT/R + 0.5V
3. This pin is an open collect/drain input pin and shall be pulled up with 4.7k-10kohms to VccT in the module
4. See SFF-8431 4.2 2-wire electrical specification
5. This pin shall be pulled up with 4.7k-10kohms to Host\_Vcc on the host board
6. If implementing, SFF-8079 pin 7 and 9 are used for RS0 and RS1 respectively

### Recommended Interface Circuit



### Digital Diagnostic Memory Map

