25GBase-LR 10km SFP28 Transceiver

ESTRSCS004

Product Features

- Up to 24.33Gb/s for CPR
- 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 1310nm DFB laser
- Up to 10km on 9/125µm SMF
- Single +3.3V power supply
- 1.5W max. power consumption with established link

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage temperature	T_S	-40	85	°C
Supply voltage	V_{CC3}	-0.5	4	V
Relative humidity	RH	5	95	%

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Operating case temperature	T_C	0	25	70	°C	Commercial
Operating case temperature	T_C	-40	25	85	°C	Industrial
Power supply voltage	V_{CC3}	3.135	3.3	3.465	V	
Data rate			24.33 25.78	28	Gbps	

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Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Module supply current	I_{CC}			450	mA
Power dissipation	P_D			1500	mW
Transmitter					
Input differential impedance	Z_{IN}		100		Ω
Differential data input swing	$V_{IN,P-P}$	180		700	mV_{P-P}
TX_fault, transmitter fault	V_{OH}	2.0		V_{CCHOST}	V
TX_fault, normal operation	V_{OL}	0		0.8	V
TX_disable, transmitter disable	V_{IH}	2.0		V_{CCHOST}	V
TX_disable, transmitter enable	V_{IL}	0		0.8	V
Receiver					
Output differential impedance	Z_O		100		Ω
Differential data output swing	$V_{OUT,P-P}$	300		850	mV_{P-P}
Data output rise time, fall time	t_r, t_f	15			ps
RX_LOS, loss of signal (LOS)	V_{OH}	2.0		V_{CCHOST}	V
RX_LOS, normal operation	V_{OL}	0		0.8	V

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Transmitter					
Launch optical power	Po	-4.5		4.5	dBm
Extinction ratio	ER	4			dB
Center wavelength	λc	1290	1310	1320	nm
Optical modulation amplitude	OMA	-1.3		4.5	dBm
Transmitter and dispersion penalty	TDP			2.2	dB
Special width	Δλ			1	Nm
$RIN_{12}OMA$				-128	dB/Hz
Optical return loss tolerance	ORLT			12	dB
Pout @TX_disable asserted	Poff			-30	dBm
Eye diagram	25GBase-LR mask and filter				
Receiver					
Center wavelength	λc	1260	1310	1360	nm
Receiver OMA sensitivity	RxSENS			-10.6	dBm

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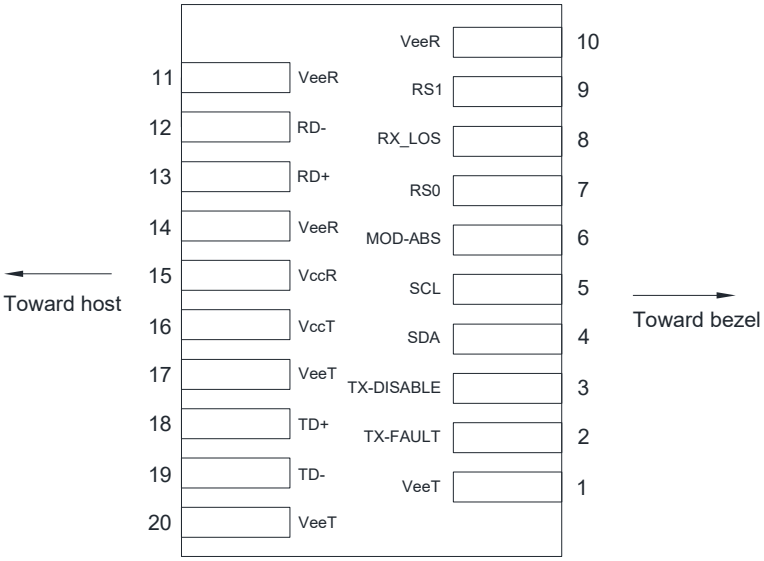
Receiver overload (Pavg)	Pol	1.5			dBm
Optical return loss	ORL	26			dB
LOS de-assert	LOSD			-13	dBm
LOS assert	LOSA	-30			dBm
LOS hysteresis		0.5			dB

Pin Descriptions



Pin	Symbol	Descriptions	Note
1	VeeT	Transmitter ground	1
2	TX_fault	Transmitter fault (LVTTL-O) – high indicates a fault condition	2
3	TX_disable	Transmitter disable (LVTTL-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)	

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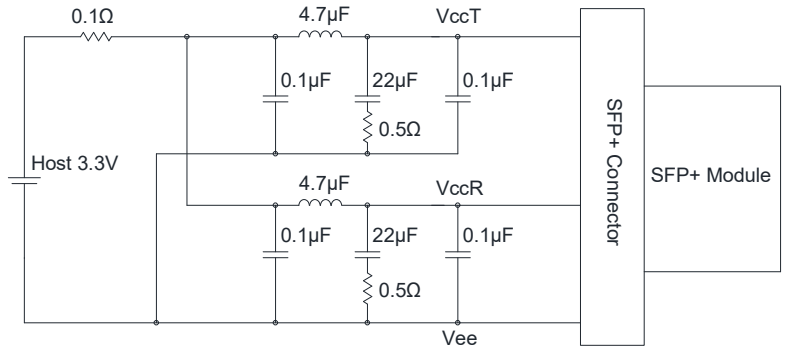
13	RD+	Received data out (CML-O)	
14	VeeR	Receiver ground	
15	VccR	Receiver power +3.3V	
16	VccT	Transmitter power +3.3V	
17	VeeT	Transmitter ground	1
18	TD+	Transmitter data in (CML-I)	
19	TD-	Reverse transmitter data in (CML-I)	
20	VeeT	Transmitter ground	1

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

Board Power Supply Filter Network



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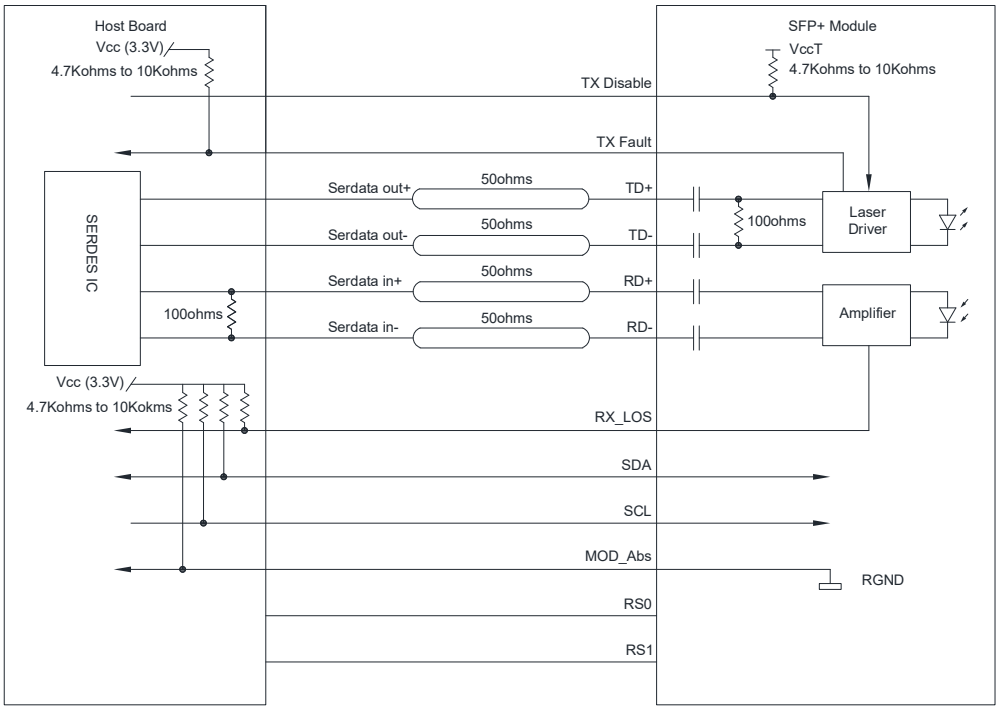
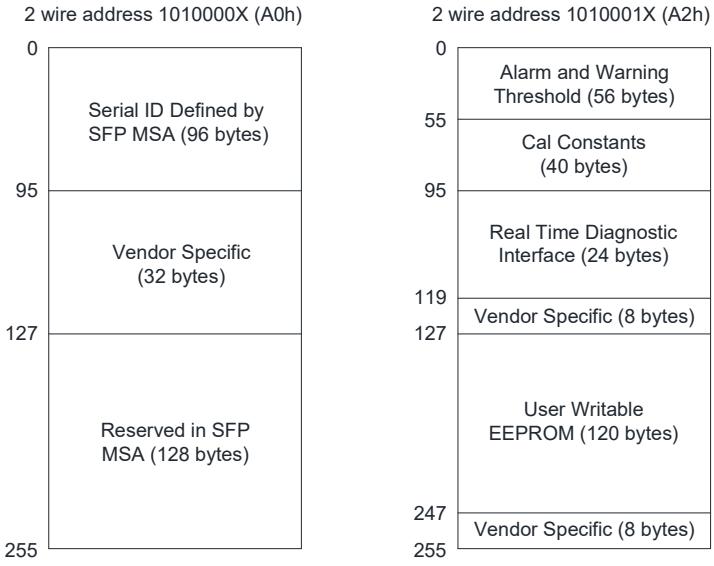
Recommended Interface Circuit



Digital Diagnostic Memory Map



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