SFP28-10/25G-LR-C

MSA and TAA Compliant 25GBase-LR SFP28 Transceiver Dual Rate 10/25G (SMF, 1310nm, 10km, LC, DOM)

Features:

- Supports 25.78GB/s bi-directional data links
- Electrical interface specifications 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 9/125um SMF
- Single +3.3V power supply
- Class 1 laser safety certified
- 1.5W maximum power consumption with established link
- Commercial Operating Temperature: 0˚C to +70˚C
- RoHS compliant and Lead Free

Applications:

- High speed storage area networks
- 25G high speed interconnection

Product Description:

This MSA compliant compatible SFP28 transceiver provides 25GBase-LR throughput up to 10km over single-mode fiber (SMF) using a wavelength of 1310nm via an LC connector. It is guaranteed to be 100% compatible with the equivalent MSA compliant transceiver. This easy to install, hot swappable transceiver has been programmed, uniquely serialized and data-traffic and application tested to ensure that it will initialize and perform identically. Digital optical monitoring (DOM) support is also present to allow access to real-time operating parameters. This transceiver is Trade Agreements Act (TAA) compliant. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

ProLabs' transceivers are RoHS compliant and lead-free.

TAA refers to the Trade Agreements Act (19 U.S.C. & 2501-2581), which is intended to foster fair and open international trade. TAA requires that the U.S. Government may acquire only "U.S. – made or designated country end products."

Regulatory Compliance

- ESD to the Electrical PINs: compatible with MIL-STD-883E Method 3015.4.
- ESD to the LC Receptacle: compatible with IEC 61000-4-3.
- EMI/EMC: compatible with FCC Part 15 Subpart B Rules, EN55022:2010.
- Laser Eye Safety: compatible with FDA 21CFR, EN60950-1& EN (IEC) 60825-1, 2.
- RoHS: compliant with EU RoHS 2.0 directive 2015/863/EU.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Maximum Supply Voltage	Vcc	-0.5		4.0	V	
Storage Temperature	Tstg	-40		85	°C	
Operating Case Temperature	Tc	0	25	70	°C	
Relative Humidity	RH	5		95	%	
Data Rate			24.33 25.78		Gbps	
Bit Error Rate	BER			$5x10^{-5}$		1
Supported Link Length on 9/125µm SMF @25.78Gbps	L		10		km	2

Notes:

1. Tested with PRBS $2^{31}-1$ test pattern for 25.78Gbps operation.
2. Distances are based on FC-PI-6 Rev 3.1 and IEEE 802.3 standards with FEC.

Electrical Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Supply Voltage		Vcc	3.135	3.3	3.465	V	
Module Supply Current		Icc			450	mA	
Power Dissipation		P_D			1500	mW	
Data Rate		BR		25.78			
Transmitter							
Differential Input Impedance		ZIN		100		Ω	
Differential Data Input Swing		VIN,pp	180		700	mVp-p	
Tx_Fault	Transmitter Fault	VOH	2.0		Host_Vcc	V	
	Normal Operation	VOL	0		0.8	V	
Tx_Disable	Transmitter Disable	VIH	2.0		Host_Vcc	V	T
	Transmitter Enable	VIL	0		0.8	V	
Receiver							

Differential Output Impedance		ZOUT		100		Ω	
Differential Data Output Swing		VOUT,pp	300		850	mVp-p	1
Data Output Rise Time/Fall Time		Tr/Tf	15			ps	2
Rx_LOS	Loss of Signal (LOS)	VOH	2.0		Host_Vcc	V	3
	Normal Operation	VOL	0		0.8	V	3

Notes:

3. Internally AC coupled but requires an external 100Ω differential load termination.
4. 20-80%.
5. LOS is an open collector output. Should be pulled up with 4.7kΩ on the host board.

Optical Characteristics

| Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Launch Optical Power	Po	-5		+2	dBm	1
Extinction Ratio	ER	3.5			dB	
Center Wavelength Range	λC	1295	1310	1325	nm	
Transmitter Dispersion Penalty	TDP			2.7	dB	
Spectral Width	Δλ			1	nm	2
Optical Rise/Fall Time @25.78Gbps	Tr/Tf	15			ps	3
Optical Return Loss Tolerance	ORLT			12	dB	
Pout @Tx_Disable Asserted	Poff			-30	dBm	
Receiver						
Center Wavelength	λC	1260	1310	1370	nm	
Receiver OMA Sensitivity	ROMA			-12	dBm	4
Receiver Overload (Pavg)	P_{max}	2			dBm	
Optical Return Loss	ORLT	26			dB	
LOS De-Assert	LOSD			-16	dBm	
LOS Assert	LOSA	-30			dBm	
LOS Hysteresis		0.5			dB	

Notes:

1. Class 1 Laser Safety per FDA/CDRH and EN (IEC) 60825 regulation.
2. 20dB spectral width.
3. Unfiltered (20-80%).
4. Measured with PRBS 2^{31}-1 at 5×10^{-5} BER.

Pin Descriptions

| Pin	Symbol	Name/Descriptions	Ref.
1	VeeT	Transmitter Ground.	1
2	Tx_Fault	Transmitter Fault. LVTTL-O. "High" indicated a fault condition.	2
3	Tx_Disable	Transmitter Disable. LVTTL-I. "High" or "open" disables the transmitter.	3
4	SDA	2-Wire Serial Interface Data. LVCMOS-I/O. MOD-DEF2.	4
5	SCL	2-Wire Serial Interface Clock. 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	VeeR	Receiver Ground.	1
11	VeeR	Receiver Ground.	1
12	RD-	Inverse Received Data Out. CML-O.	
13	RD+	Received Data Out. CML-O.	
14	VeeR	Receiver Ground.	
15	VccR	+3.3V Receiver Power.	
16	VccT	+3.3V Transmitter Power.	
17	VeeT	Transmitter Ground.	1
18	TD+	Transmitter Data In. CML-I.	
19	TD-	Inverse Transmitter Data In. CML-I.	
20	VeeT	Transmitter Ground.	1

Notes:

1. The module signal grounds are isolated from the module case.
2. This is an open collector/drain output that on the host board requires a 4.7kΩ-10kΩ pull-up resistor to the Host_Vcc.
3. This input is internally biased high with a 4.7kΩ-10kΩ pull-up resistor to the VccT.
4. 2-Wire Serial Interface Clock and Data lines require an external pull-up resistor dependent on the capacitance load.
5. This is a ground return that on the host board requires a 4.7kΩ-10kΩ pull-up resistor to the Host_Vcc.
6. Rate Select can also be set through the 2-wire bus in accordance with SFF-8472 v. 12.1. Rx Rate Select is set at Bit 3, Byte 110, and Address A2h, and Tx Rate Select is set at Bit 3, Byte 118, and Address A2h. **Note:** Writing a "1" selects maximum bandwidth operation. Rate Select is the logic OR of the input state of Rate Select Pin and 2-wire bus.
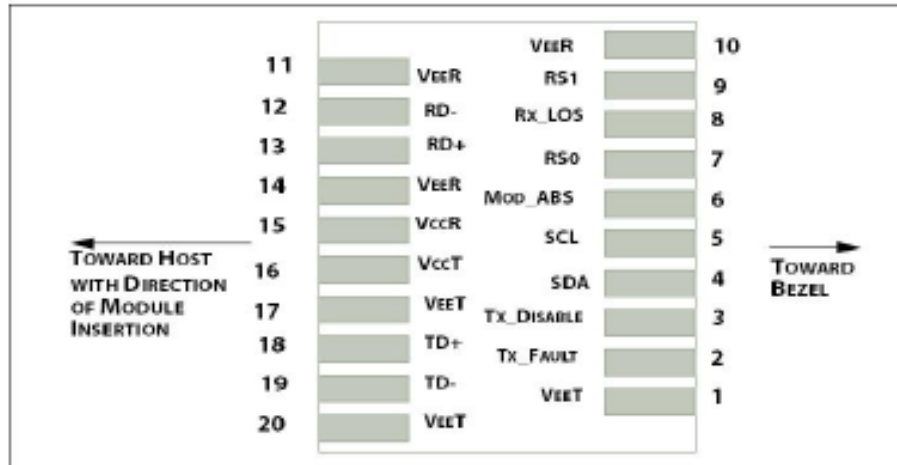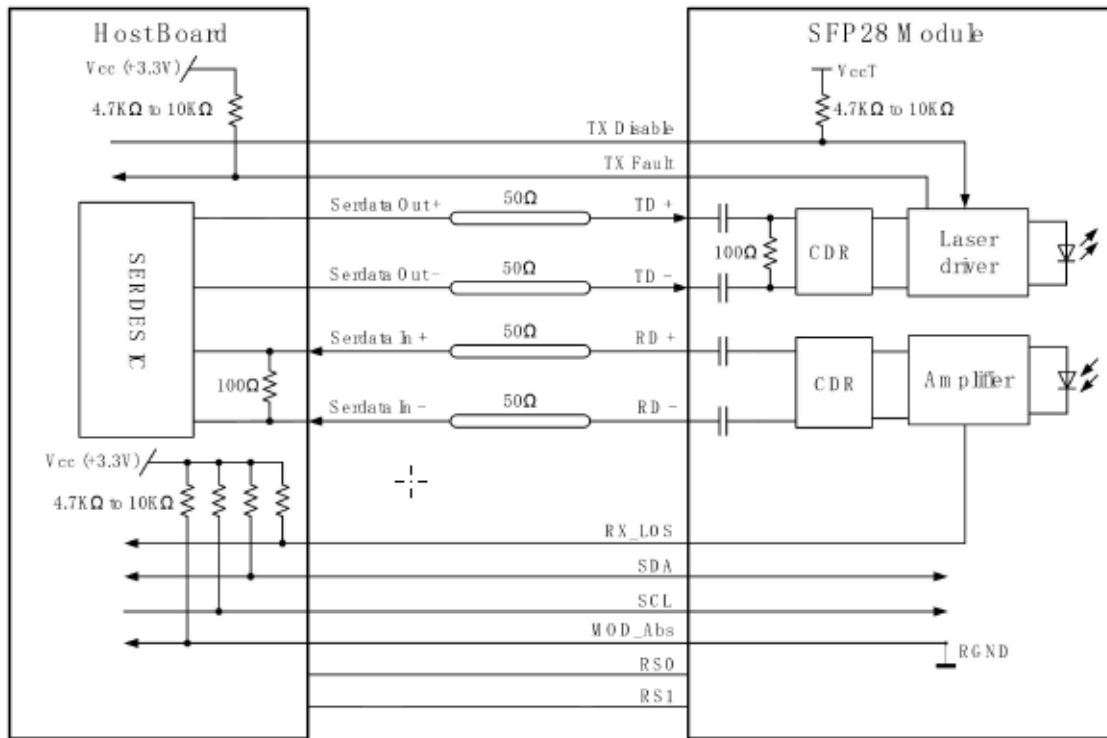
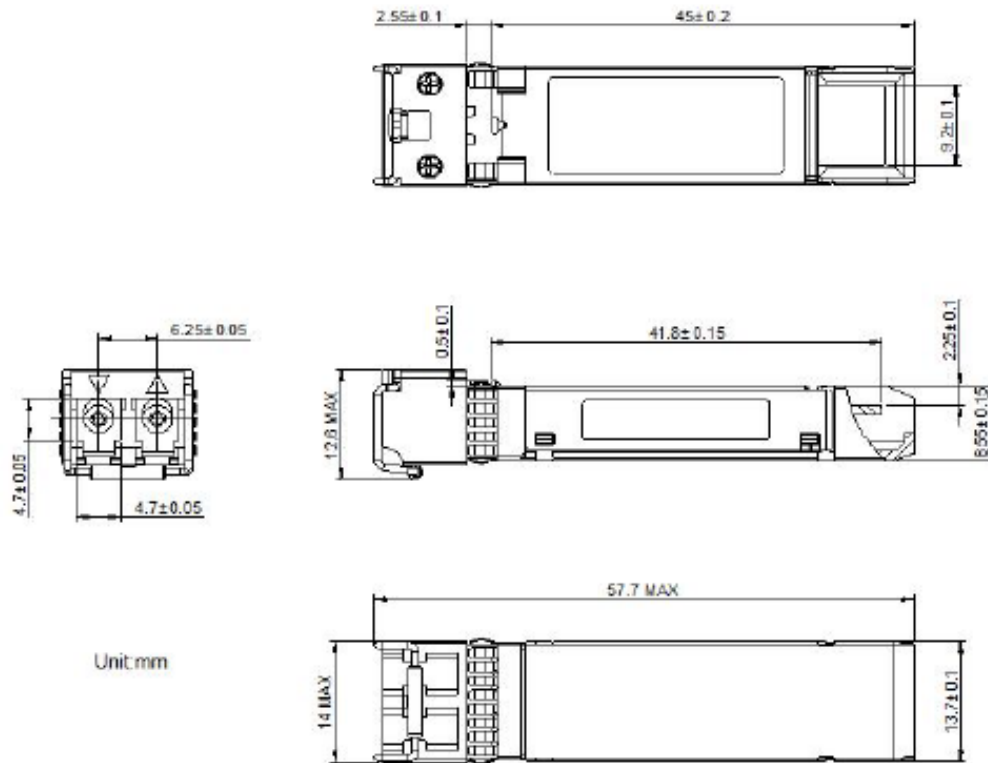Host PCB SFP28 Pad Assignment

Recommended Host Board
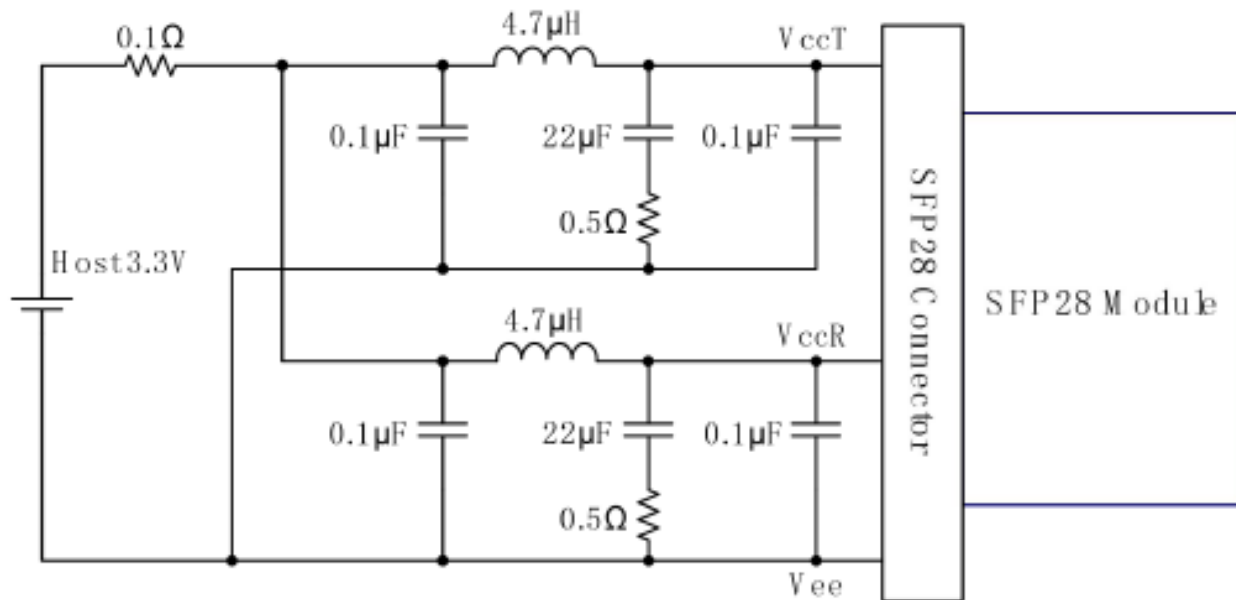
Recommended Host Board Power Supply Filter Network

Recommended Application Interface Block Diagram

Mechanical Specifications

Unit:mm

About ProLabs

Our experience comes as standard; for over 15 years ProLabs has delivered optical connectivity solutions that give our customers freedom and choice through our ability to provide seamless interoperability. At the heart of our company is the ability to provide state-of-the-art optical transport and connectivity solutions that are compatible with over 90 optical switching and transport platforms.

Complete Portfolio of Network Solutions

ProLabs is focused on innovations in optical transport and connectivity. The combination of our knowledge of optics and networking equipment enables ProLabs to be your single source for optical transport and connectivity solutions from 100Mb to 400G while providing innovative solutions that increase network efficiency. We provide the optical connectivity expertise that is compatible with and enhances your switching and transport equipment.

Trusted Partner

Customer service is our number one value. ProLabs has invested in people, labs and manufacturing capacity to ensure that you get immediate answers to your questions and compatible product when needed. With Engineering and Manufacturing offices in the U.K. and U.S. augmented by field offices throughout the U.S., U.K. and Asia, ProLabs is able to be our customers best advocate 24 hours a day.

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