



SFP-25GB-LRL-I-OPC

MSA and TAA 25GBase-LRL SFP28 Transceiver Capable (SMF, 1310nm, 2km, LC, DOM, -40 to 85C)

Features

- Up to 25.78Gbps Bi-Directional Data Links
- SFP28 MSA Package with Duplex LC Connectors
- Up to 2km on 9/125µm SMF
- Single 3.3V Power Supply
- Class 1 Laser Safety Certified
- Built-In Dual CDR with Shut-Off Control
- Uncooled 1310nm DFB Laser
- Power Consumption: less than 1.2W
- Operating Temperature: -40 to 85 Celsius
- RoHS Compliant and Lead-Free



Applications:

- 25GBase Ethernet
- Access and Enterprise

Product Description

This MSA compliant SFP28 transceiver provides 25GBase-LRL throughput up to 2km over single-mode fiber (SMF) using a wavelength of 1310nm via an LC connector. It is capable of withstanding rugged environments and can operate at temperatures between -40 and 85C. All of our transceivers are built to comply with Multi-Source Agreement (MSA) standards and are uniquely serialized and tested for data-traffic and application to ensure seamless network integration. Additional product features include Digital Optical Monitoring (DOM) support which allows 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.

OptioConnect's transceivers are RoHS compliant and lead-free.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Supply Voltage	Vcc	-0.5		4.0	V	
Storage Temperature	Tstg	-40		85	°C	
Operating Case Temperature	Tc	-40	25	85	°C	
Relative Humidity	RH	5		95	%	
Maximum Receive Power				2	dBm	
Data Rate		9.8304		25.78125	Gbps	

Electrical Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Supply Voltage		Vcc	3.135	3.3	3.465	V	
Module Supply Current		Icc			360	mA	
Power Dissipation		P _{DISS}			1200	mW	
Transmitter							
Input Differential Impedance		Z _{IN}		100		Ω	
Differential Data Input Swing		V _{IN,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	
	Transmitter Enable	VIL	0		0.8	V	
Receiver							
Output Differential Impedance		Z _O		100		Ω	
Differential Data Output Swing		V _{OUT,pp}	300		850	mVp-p	1
Data Output Rise/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:

1. Internally AC coupled but requires an external 100Ω differential load termination.
2. 20-80%.
3. 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	Pavg	-5		2	dBm	1
Optical Modulation Amplitude	POMA	-7		2	dBm	
Extinction Ratio	ER	3.5			dB	
Center Wavelength Range	λ_C	1295	1310	1325	nm	
Transmitter Dispersion Penalty	TDP			1.0	dB	
SMSR		30			dB	
Spectral Width	$\Delta\lambda$			1	nm	2
Optical Return Loss Tolerance	ORLT			20	dB	
Transmitter Reflectance				-26	dB	
POUT @Tx_Disable Asserted	Poff			-30	dBm	
Eye Test : {X1, X2, X3, Y1, Y2, Y3}		5			%	3
Receiver						
Center Wavelength	λ_C	1295	1310	1325	nm	
Receiver OMA Sensitivity	RxSENS			-11	dBm	4
Receiver Overload (Pavg)	POL	2			dBm	
Receiver Reflectance				-26	dB	
LOS De-Assert	LOSD			-15	dBm	
LOS Assert	LOSA	-30			dBm	
LOS Hysteresis		0.5		5	dB	

Notes:

1. Class 1 Laser Safety per FDA/CDRH and EN (IEC) 60825 regulations.
2. 20dB spectral width.
3. Test condition: {0.31, 0.4, 0.45, 0.34, 0.38, 0.4}. Hit count = $5E^{-5}$.
4. Measured with PRBS $2^{31}-1$ at 5×10^{-5} BER.

Pin Descriptions

Pin	Symbol	Name/Description	Notes
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” 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 the VeeT or VeeR in the module.	5
7	RS0	Hardware Tx Rate Select Pin.	6
8	Rx_LOS	Receiver Loss of Signal (LVTTTL-O).	2
9	RS1	Hardware Rx Rate Select Pin.	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

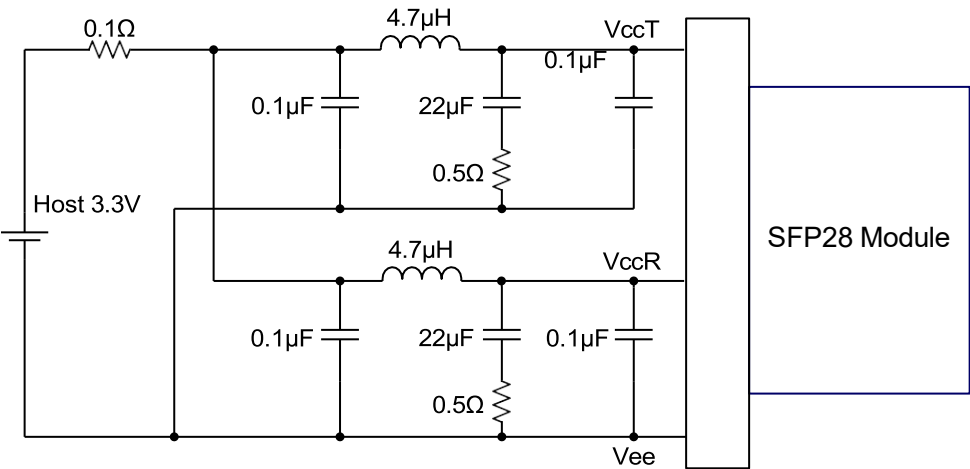
Notes:

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 4.7k Ω to 10k Ω pull-up resistor to the Host_Vcc.
3. This input is internally biased “high” with a 4.7k Ω to 10k Ω 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 4.7k Ω to 10k Ω 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. Tx Rate Select is set at Bit 3, Byte 118, and Address A2h.
Note: Writing a “1” selects the maximum bandwidth operation. Rate Select is the logic OR of the input state of Rate Select Pin and 2-wire bus.

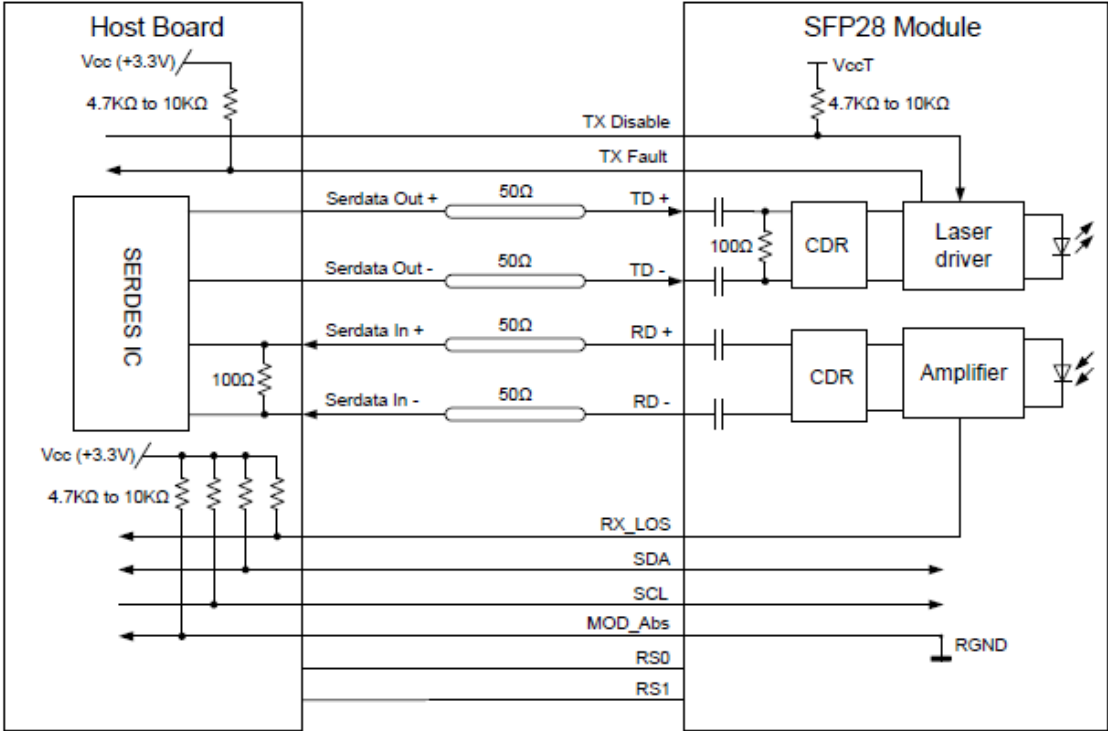
Electrical Pin-Out Details



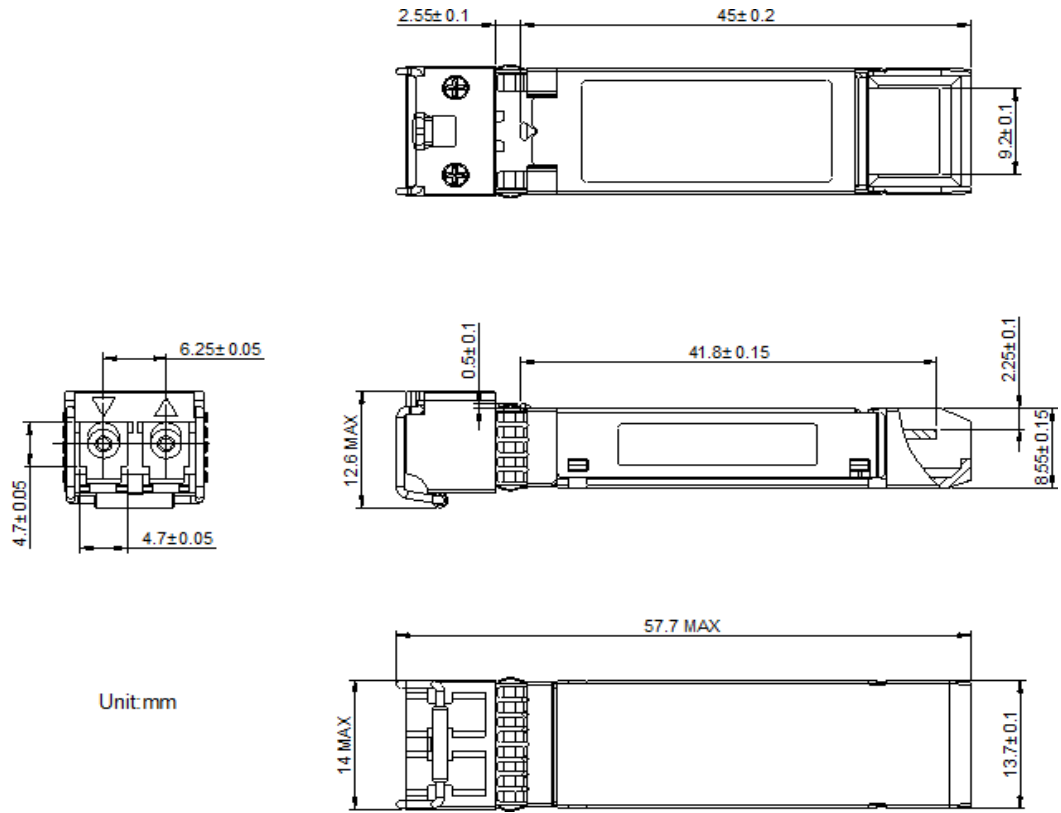
Recommended Host Board Power Supply Filter Network



Recommended Application Interface Block Diagram



Mechanical Specifications



OptioConnect

Innovation for the Future of High-Speed Networking

Who We Are

OptioConnect is reshaping the landscape of communication and high-speed networking through intelligent technology. With a core focus on cutting edge technology, we deliver smarter fiber optic solutions for enterprise networks, data centers, and next-gen telecom infrastructures.

What We Do

At OptioConnect, we fuse advanced engineering with intelligent automation to drive the future of networking. Our AI-integrated solutions are designed to optimize performance and streamline operations with:

- Superior Performance
- Network and traffic optimization
- Intelligent energy management
- Seamless OEM compatibility
- Scalable cost-efficiency

Smarter Networks by Design

Innovation isn't just a goal—it's our process. We embed AI and machine learning across our R&D and product lines, enabling adaptive performance, automated tuning, and faster deployment cycles. The result? Networks that don't just work—they learn, evolve, and outperform.

Our Team

Our engineers, data scientists, and network architects bring decades of experience and a future-focused mindset. We provide hands-on support with intelligent insights that turn complex challenges into simple solutions.

Our Mission

To deliver AI-enhanced connectivity that reduces cost, increases speed, and maximizes efficiency—empowering our partners to operate at the forefront of a rapidly evolving digital world.

Let's Connect

Discover how OptioConnect's intelligent infrastructure solutions can power your network's next leap forward.

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