

## SFP28-25G-LR-I-AO

Dell® SFP28-25G-LR Compatible TAA 10/25GBase-LR SFP28 Transceiver (SMF, 1310nm, 10km, LC, DOM, Rugged)

### Features

- SFF-8402 and SFF-8472 Compliance
- Duplex LC Connector
- Industrial Temperature -40 to 85 Celsius
- Single-mode Fiber
- Hot Pluggable
- Excellent ESD Protection
- Metal with Lower EMI
- RoHS Compliant and Lead Free



### Applications

- 25GBase Ethernet
- Access and Enterprise

### Product Description

This Dell® SFP28-25G-LR-I 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 Dell® 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.

AddOn's 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
Storage Temperature	Ts	-40		85	°C	
Relative Humidity	RH	5		95	%	
Supply Voltage	Vcc	-0.5		4.0	V	
Operating Case Temperature	Tc	-40	25	85	°C	
Data Rate	BR		25.78		Gb/s	
Bit Error Rate	BER			5x10 <sup>-5</sup>		1
Supported Link Length on 9/125um SMF, 25.78GB/s	L		10		km	2

### Notes:

1. Tested with a PRBS 2<sup>31</sup>-1 test pattern for 25.78Gb/s operation.
2. Distances are based on FC-PI-6 Rev 3.1 and IEEE 802.3 standards.

## Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Notes	
Supply Voltage	V <sub>CC</sub>	3.135	3.3	3.465	V		
Data Rate			25.78		GB/s		
Module Supply Current	I <sub>CC</sub>			450	mA		
Power Dissipation	P <sub>D</sub>			1500	mW		
<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	
	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	
	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 Rinse Time, Fall Time	t <sub>r</sub> , t <sub>f</sub>	15			Ps	2	
Rx_LOS	Loss of Signal (LOS)	V <sub>OH</sub>	2.0		V <sub>CCHOST</sub>	V	3
	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 output. Should be pulled up with 4.7Ω on the host board.

## Optical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Notes
<b>Transmitter</b>						
Launch Optical Power	$P_o$	-5		2	dBm	1
Extinction Ratio	ER	4			dB	
Center Wavelength Range	$\lambda_c$	1295	1310	1325	nm	
Optical Modulation Amplitude	OMA	631			uW	
Transmitter Dispersion Penalty	TDP			2.7	dB	
Spectral Width	$\Delta\lambda$			1	nm	2
Optical Rise/Fall Time @25.78 Gb/s	tr/tf			15	ps	3
Optical Return Loss Tolerance	ORLT			12	dB	
Pout @TX-Disable Asserted	$P_{OFF}$			-30	dBm	1
<b>Receiver</b>						
Center Wavelength	$\lambda_c$	1260	1310	1370	nm	
Receiver OMA Sensitivity	RxSENS			-11.4	dBm	4
Receiver Overload (P avg)	$P_{OL}$	2			dBm	
Optical Return Loss	ORL	26			dB	
LOS De-Assert	$LOS_D$			-13	dBm	
LOS Assert	$LOS_A$	-30			dBm	
LOS Hysteresis		0.5			dB	

### Notes:

1. Class 1 Laser Safety per FDA/CDRH and EN (IEC) 60825 regulations.
2. 20dB spectral width.
3. Unfiltered, 20-80%.
4. Measured with PRBS 231-1 at  $5 \times 10^{-5}$  BER.

## Pin Description

Pin	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	Two wire serial interface Data Line (LVCMOS-I/O) (MOD-DEF2)	4
5	SCL	Two 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		6
8	RX_LOS	Receiver Loss of Signal (LVTTTL-O)	2
9	RS1		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	Receiver Power - +3.3V	
16	VccT	Transmitter Power - +3.3 V	
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 to 10KΩ pull-up resistor to VccHost.
3. This input is internally biased high with a 4.7KΩ to 10KΩ pull-up resistor to VccT.
4. Two-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 to 10KΩ pull-up resistor to VccHost.
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, Address A2h. Tx Rate Select is set at Bit 3, Byte 118, 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 top view



### Recommended Host Board Power Supply Filter Network



## Recommended Application Interface Block Diagram



## Mechanical Specifications



## **About AddOn Networks**

In 1999, AddOn Networks entered the market with a single product. Our founders fulfilled a severe shortage for compatible, cost-effective optical transceivers that compete at the same performance levels as leading OEM manufacturers. Adhering to the idea of redefining service and product quality not previously had in the fiber optic networking industry, AddOn invested resources in solution design, production, fulfillment, and global support.

Combining one of the most extensive and stringent testing processes in the industry, an exceptional free tech support center, and a consistent roll-out of innovative technologies, AddOn has continually set industry standards of quality and reliability throughout its history.

Reliability is the cornerstone of any optical fiber network and is engrained in AddOn's DNA. It has played a key role in nurturing the long-term relationships developed over the years with customers. AddOn remains committed to exceeding industry standards with certifications from ranging from NEBS Level 3 to ISO 9001:2005 with every new development while maintaining the signature reliability of its products.

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