

### **SFP-25GB-DW-C-15-E-C**

MSA and TAA 10/25GBase-DWDM SFP28 Transceiver Dual-Rate 100GHz (SMF, Tunable, 15km, LC, DOM, -20 to 85C)

#### **Features:**

- SFF-8432 and SFF-8472 Compliant
- Duplex LC Connector
- 100GHz Channel Spacing
- Supports 24.33024G, 25.78125Gbps (with FEC); 9.8304G, 10.1376G, 10.3125Gbps
- Extended Temperature -20 to 85 Celsius
- Single-mode Fiber
- Hot Pluggable
- Excellent ESD Protection
- Metal with Lower EMI
- RoHS Compliant and Lead Free



#### **Applications:**

- 25GBase
- Access, Metro and Enterprise

#### **Product Description**

This MSA Compliant SFP28 transceiver provides 10/25GBase-DWDM throughput up to 15km over single-mode fiber (SMF) using a tunable wavelength via an LC connector. It is built to MSA standards and is uniquely serialized and data-traffic and application tested to ensure that they will integrate into your network seamlessly. 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.

## DWDM Wavelength ITU Channels - 100 GHz Spacing

ITU Channel	Center Wavelength (nm)	Frequency (THz)	ITU Channel	Center Wavelength (nm)	Frequency (THz)
14	1566.31	191.4	38	1546.92	193.8
15	1565.50	191.5	39	1546.12	193.9
16	1564.68	191.6	40	1545.32	194.0
17	1563.86	191.7	41	1544.53	194.1
18	1563.05	191.8	42	1543.73	194.2
19	1562.23	191.9	43	1542.94	194.3
20	1561.42	192.0	44	1542.14	194.4
21	1560.61	192.1	45	1541.35	194.5
22	1559.79	192.2	46	1540.56	194.6
23	1558.98	192.3	47	1539.77	194.7
24	1558.17	192.4	48	1538.98	194.8
25	1557.36	192.5	49	1538.19	194.9
26	1556.55	192.6	50	1537.4	195.0
27	1555.75	192.7	51	1536.61	195.1
28	1554.94	192.8	52	1535.82	195.2
29	1554.13	192.9	53	1535.04	195.3
30	1553.33	193.0	54	1534.25	195.4
31	1552.52	193.1	55	1533.47	195.5
32	1551.72	193.2	56	1532.68	195.6
33	1550.92	193.3	57	1531.9	195.7
34	1550.12	193.4	58	1531.12	195.8
35	1549.32	193.5	59	1530.33	195.9
36	1548.51	193.6	60	1529.55	196.0
37	1547.72	193.7	61	1528.77	196.1

## Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit
Maximum Supply Voltage	V <sub>CC</sub>	0	3.3	3.6	V
Storage Temperature	T <sub>stg</sub>	-40		85	°C
Operating Case Temperature	T <sub>c</sub>	-20		85	°C
Operating Humidity	RH	0		85	%
Data Rate	DR	24.33024 9.8304		25.78125 10.3125	Gbps
Data Rate Accuracy		-100		100	ppm
9/125μm G.652 SMF				15	km

## Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	V <sub>CC</sub>	3.135	3.30	3.465	V	
Power Dissipation	P <sub>DISS</sub>			2.5	W	1
Power Supply Current	I <sub>CC</sub>			0.76	A	
<b>Transmitter</b>						
Data Rate	DR	24.33024 9.8304		25.78125 10.3125	Gbps	CDR Bypass
Differential Voltage pk-pk	V <sub>IN,pp</sub>	180		900	mV	
Tx Differential Input Impedence	Z <sub>IN</sub>		100		Ω	
Transmitter Disable Voltage	V <sub>D</sub>	2		V <sub>ee</sub> + 0.3	V	
Transmitter Enable Voltage	V <sub>EN</sub>	0		0.8	V	
<b>Receiver</b>						
Data Rate	DR	24.33024 9.8304		25.78125 10.3125	Gbps	CDR Bypass
Differential Voltage pk-pk	V <sub>IN,pp</sub>	450	600	900	mV	
Rx Differential Output Impedence	Z <sub>OUT</sub>		100		Ω	
LOS Assert Voltage	V <sub>LOSA</sub>	2.4		V <sub>CC</sub>	V	
LOS De-Assert Voltage	V <sub>LOSD</sub>	V <sub>ee</sub>		V <sub>ee</sub> +0.4	V	
Eye Height	EH <sub>15</sub>	228			mV	
Eye Width	EW <sub>15</sub>	0.57			UI	
Vertical Eye Closure	VEC			5.5	dB	

### Notes:

1. Power dissipation is less than 2.5W when supply voltage is 3.3V.

## Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Output Average Power	PO	0		4	dBm	
Wavelength Range	$\lambda_C$	1528.77		1566.31	nm	
Wavelength Accuracy		-12.5		12.5	GHz	
Frequency Range		191.3		196.0	THz	
Channel Spacing			100		GHz	
Extinction Ratio	ER	3.5			dB	
Side-Mode Suppression Ratio	SMSR	30			dB	
Transmitter Eye Mask Definition {X1, X2, X3, Y1, Y2, Y3}	{0.31, 0.4, 0.45, 0.34, 0.38, 0.4} Hit ratio $5 \times 10^{-5}$ hits per sample					
Receiver						
Frequency Range		191.3		196.0	THz	
Saturation Power		-2		-23	dBm	
Receiver Sensitivity	S			-14 (5e <sup>-5</sup> FEC)	dBm	
Receiver Sensitivity (After 15km)	S			-14 (5e <sup>-5</sup> FEC)	dBm	
LOS Assert	LOSA	-30			dBm	
LOS De-Assert	LOSD			-16	dBm	
LOS Hysteresis		0.5			dB	
SRS Eye Mask Definition {X1, X2, X3, Y1, Y2, Y3}	{0.31, 0.4, 0.45, 0.34, 0.38, 0.4}					

## Pin Descriptions

Pin	Symbol	Name	Ref.
1	VeeT	Transmitter Ground.	1
2	Tx_Fault	Transmitter Fault Indication.	
3	Tx_Disable	Disables the transmitter or laser output.	2
4	SDA	2-Wire Serial Interface Data.	2
5	SCL	2-Wire Serial Interface Clock.	2
6	Mod_ABS	Indicates the module online state. This pin is connected to the VeeT or VeeR pin.	
7	RS0	Selects a rate for the module. This pin is connected to the 33k $\Omega$ resistor.	
8	LOS	Indicates a loss of received signals.	2
9	RS1	Selects a rate for the module. This pin is connected to the 33k $\Omega$ resistor.	
10	VeeR	Receiver Ground.	1
11	VeeR	Receiver Ground 1.	1
12	RD-	Inverse Received Data Output.	
13	RD+	Received Data Output.	
14	VeeR	Receiver Ground.	1
15	VccR	+3.3V Receiver Power.	1
16	VccT	+3.3V Transmitter Power.	1
17	VeeT	Transmitter Ground.	1
18	TD+	Transmit Data Input.	
19	TD-	Inverse Transmit Data Input.	
20	VeeT	Transmitter Ground.	1

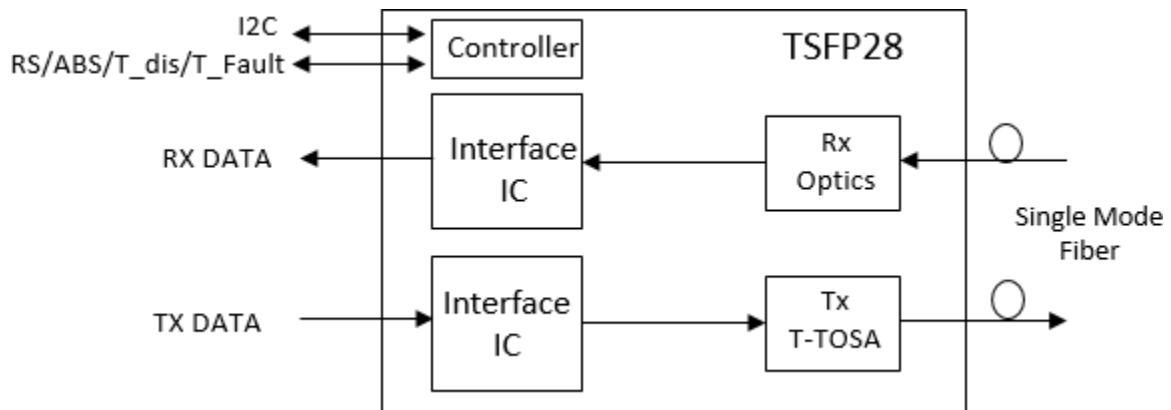
### Notes:

1. The ground of the module (operating module ground) and that of the module shell are separate from each other.
2. 4.7k $\Omega$ –10k $\Omega$  resistor is used on the module to pull the output up to 3.15–3.45V.



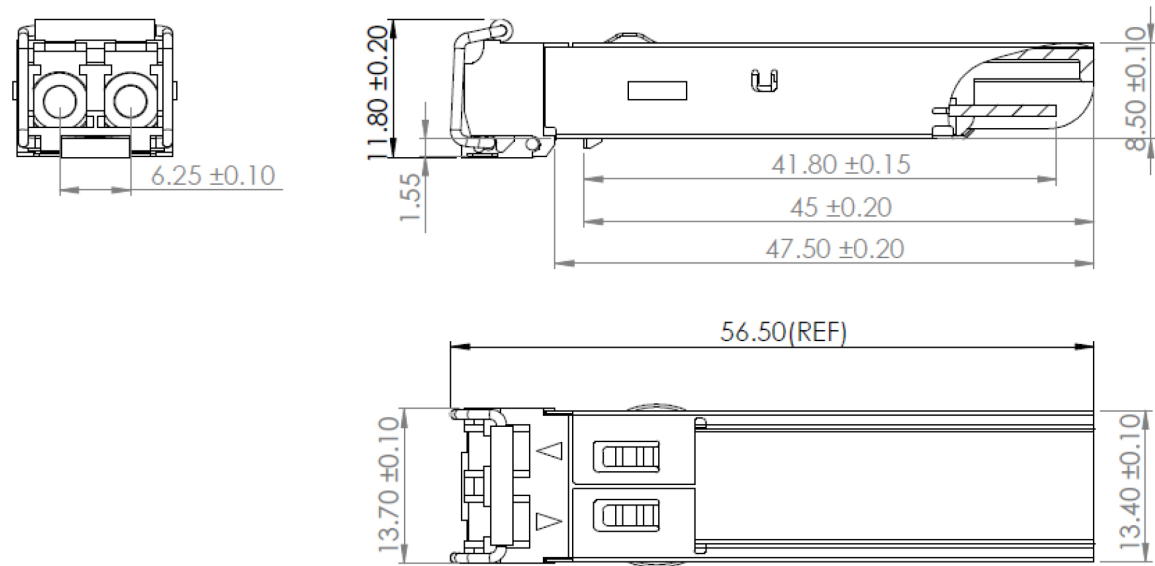
Pin-Out of Connector Block on Host Board

### Transceiver Block Diagram



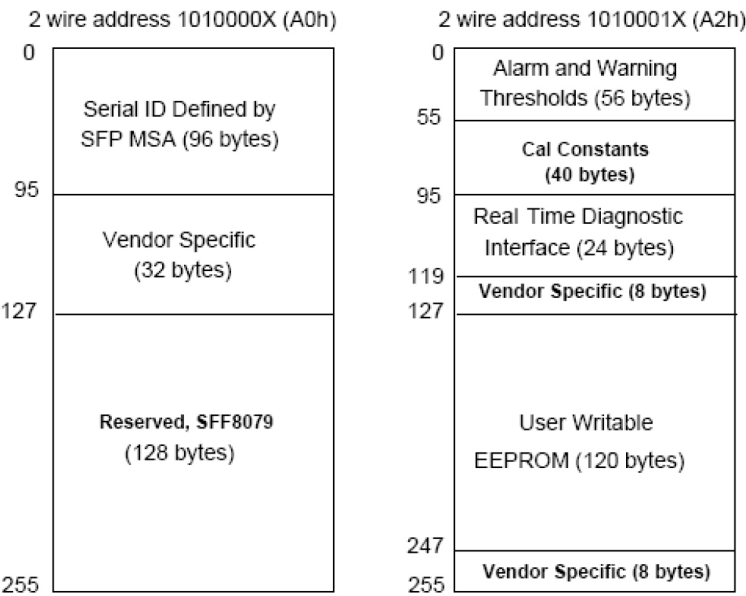
**Mechanical Specifications**

Small Form Factor Pluggable (SFP) transceivers are compatible with the dimensions defined by the SFP Multi-Sourcing Agreement (MSA).



**EEPROM Information**

EEPROM memory map-specific data field description is as below:



## **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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