

### SFP-25GB-DW-C-15-MX-C

Mellanox® Compatible TAA 10/25GBase-DWDM SFP28 Transceiver Dual-Rate 100GHz (SMF, Tunable, 15km, LC, DOM)

#### Features:

- Operating Data Rate: 9.8 to 25.78Gbps
- Compliant with SFF-8402 and SFF-8690
- C-Band 100GHz Tunable Tx(MZM-DBR)/Rx(APD)
- Supports Optical and Electrical Loopback Functions
- Supports ASP (Automated Self-Pairing) Functions
- Supports ROD (Remote DDM) Functions
- Class 1 Laser Safety
- Hot-Pluggable Electrical Interface
- Single 3.3V Power Supply
- Operating Temperature: 0 to 70 Celsius
- RoHS Compliant and Lead-Free



#### Applications:

- 25GBase
- Access, Metro and Enterprise

#### Product Description

This Mellanox® compatible dual-rate SFP28 transceiver provides 10/25GBase-DWDM throughput up to 15km over single-mode fiber (SMF) using a tunable wavelength via an LC connector. Our transceiver is built to meet or exceed OEM specifications and is guaranteed to be 100% compatible with Mellanox®. It has been programmed, uniquely serialized, and tested for data-traffic and application to ensure that it will initialize and perform identically. All of our transceivers comply with Multi-Source Agreement (MSA) standards to provide 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.

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.")



## ITU Channel Wavelength Guide

ITU Channel	Frequency (THz)	Center Wavelength (nm)	ITU Channel	Frequency (THz)	Center Wavelength (nm)
14	191.40	1566.31	38	193.80	1546.92
15	191.50	1565.50	39	193.90	1546.12
16	191.60	1564.68	40	194.00	1545.32
17	191.70	1563.86	41	194.10	1544.53
18	191.80	1563.05	42	194.20	1543.73
19	191.90	1562.23	43	194.30	1542.94
20	192.00	1561.42	44	194.40	1542.14
21	192.10	1560.61	45	194.50	1541.35
22	192.20	1559.79	46	194.60	1540.56
23	192.30	1558.98	47	194.70	1539.77
24	192.40	1558.17	48	194.80	1538.98
25	192.50	1557.36	49	194.90	1538.19
26	192.60	1556.56	50	195.00	1537.40
27	192.70	1555.75	51	195.10	1536.61
28	192.80	1554.94	52	195.20	1535.82
29	192.90	1554.13	53	195.30	1535.04
30	193.00	1553.33	54	195.40	1534.25
31	193.10	1552.52	55	195.50	1533.47
32	193.20	1551.72	56	195.60	1532.68
33	193.30	1550.92	57	195.70	1531.90
34	193.40	1550.12	58	195.80	1531.12
35	193.50	1549.32	59	195.90	1530.33
36	193.60	1548.52	60	196.00	1529.55
37	193.70	1547.72	61	196.10	1528.77

## Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Relative Humidity (Non-Condensing)	%	5		95		
Operating Case Temperature	Tc	0		70	°C	
Storage Temperature	Tstg	-40		85	°C	
Supply Voltage	V	0		4		
Data Rate	DR <sub>25</sub>	24.3		25.78	Gbps	1
	DR <sub>10</sub>	9.8	10.3	12.5		2

### Notes :

1. RS high logic.
2. RS low logic.

## Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes	
Power Supply Voltage		3.135	3.3	3.465	Vcc		
Power Dissipation	PC			3.5	W	@3.3V	
Power Supply Noise Tolerance	PSNT			66	mVp-p	1	
<b>Transmitter</b>							
Differential Input Voltage	VIN	190		700	mV	AC coupled	
Differential Input Impedance	ZIN	90	100	110	Ω		
Tx_Disable	Input Low	VIL	-0.3		0.8	V	2
	Input High	VIH	2.0		Vcc+0.3	V	
	Assert Time	tOFF			100	us	High
	Negate Time	tON			2.0	ms	Low
Tx_Disable to Start Reset	treset	10			us	High	
Time to Initialize	tInit			90	s	3	
Tx_Fault	Output Low	VFOL	-0.3		0.4	V	LVTTTL, low is normal
	Output High	IFOH	-50		37.5	uA	
RS1 (Rate Select for Tx)	VIL	-0.3		0.8	V	Internally pulled down	
	VIH	2.0		Vcc+0.3	V		
<b>Receiver</b>							
Differential Output Voltage	VOUT	300		850	mV	AC coupled	
Differential Output Impedance	ZOUT	90	100	110	Ω		
Rx_LOS (Loss of Signal)	Output Low	VLOSL	-0.3		0.4	V	LVTTTL, low is normal
	Output High	ILOSH	-50		37.5	uA	
	Assert time	tLOS-ON			100	us	High @S
	De-Assert time	tLOS-OFF			100	us	Low @S
RS0 (Rate Select for Rx)	VIL	-0.3		0.8	V	Internally pulled down	
	VIH	2		Vcc+0.3	V		

### Notes:

1. From 10Hz to 10MHz.
2. LVTTTL, normal at low, high is shutdown (Poff).
3. Including reset of Tx\_Fault.

## Optical Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes	
<b>Transmitter</b>								
Average Launch Power		Pavg	-1.0		3.0	dBm		
Optical Power Flatness		$\Delta PO$	-1.0		1.0	dB	All channels	
Transmitter Disabled Power		Poff			-30	dBm	1	
Optical Center Wavelength		$\lambda C$	1528.77		1566.31	nm	2	
Optical Center Frequency		Ffc	191.40		196.10	THz	2	
Center Wavelength Spacing				100		GHz	2	
Wavelength Stability	Beginning of Life	$\lambda p\_BOL$	-1.7	$\lambda C$	1.7	GHz	3	
	End of Life	$\lambda p\_EOL$	-2.5	$\lambda C$	2.5	GHz	3	
Wavelength Tuning Speed		TTUNE			30	ms	4	
Spectral Width					0.5	nm	@-20dB	
Side-Mode Suppression Ratio		SMSR	30			dB		
Extinction Ratio		ER	8.0			dB	PRBS2 <sup>31</sup> -1	
Relative Intensity Noise		RIN <sub>20</sub> OMA			-130.0	dB/Hz		
Optical Return Loss tolerance		ORL			20.0	dB		
Transmitter Reflectance					-26.0	dB		
Optical Eye Mask		IEEE802.3cc 114.6 25GBASE-LR/ER {X1,X2,X3,Y1,Y2,Y3} = {0.31,0.40,0.45,0.34,0.38,0.40}						Hit ratio 5E <sup>-5</sup>
<b>Receiver</b>								
Optical Sensitivity	25.78Gbps or 24.33Gbps	S1			-19.0		5	
	10.7Gbps, 10.3Gbps, 9.8Gbps	S2			-19.0		6	
	11.3Gbps to 11.1Gbps	S3			-19.0		7	
Optical Overload		OL	-4.0			dBm	8	
Operating wavelength		$\lambda o$	1525		1575	nm		
Rx_LOS (Loss of Signal)	Assert	LOSA	-30.0			dBm	9	
	De-Assert	LOSD			-23.0	dBm		
	Hysteresis	LOSH	0.5		5.0	dB		
Return Loss of Receiver					-26.0	dB		
RSSI Calibration		RCAL	Internally Calibrated (The host side can be read by an external way)					
<b>Auxiliary Management and Control Channel</b>								
Bit Rate		BR <sub>AMCC</sub>		1200		Gbps		
Modulation Depth		AMCC <sub>MD</sub>	5		10	%		
Dynamic Range		DR <sub>AMCC</sub>	-4		-24	dBm	10	

### Notes:

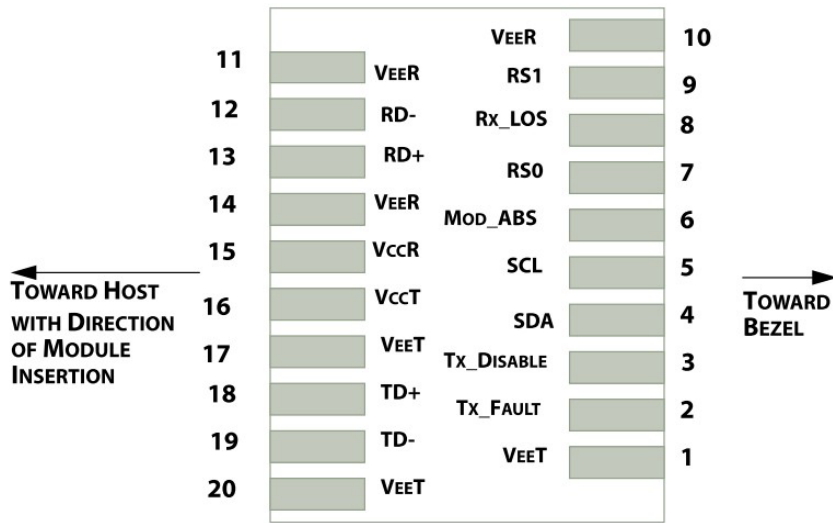
1. @Tx\_Disable is high.

2. ITU-T 694.1 grid wavelength.
3.  $\lambda_C$ =ITU grid wavelength.
4. From any channel to and other channel. ASP disable.
5. PRBS2<sup>31</sup>, BER  $5 \times 10^{-5}$ , source ER=8.0dB, SMF 15km, G652.
6. PRBS2<sup>31</sup>, BER  $5 \times 10^{-12}$ , source ER=8.0dB, SMF 15km, G652.
7. PRBS2<sup>31</sup>, BER  $5 \times 10^{-4}$ , source ER=8.0dB, SMF 15km, G652.
8. PRBS2<sup>31</sup>, source ER=8.0dB.
9. Rx squelch activated.
10. AMCC<sub>MD</sub>: 5%, 1200bps.

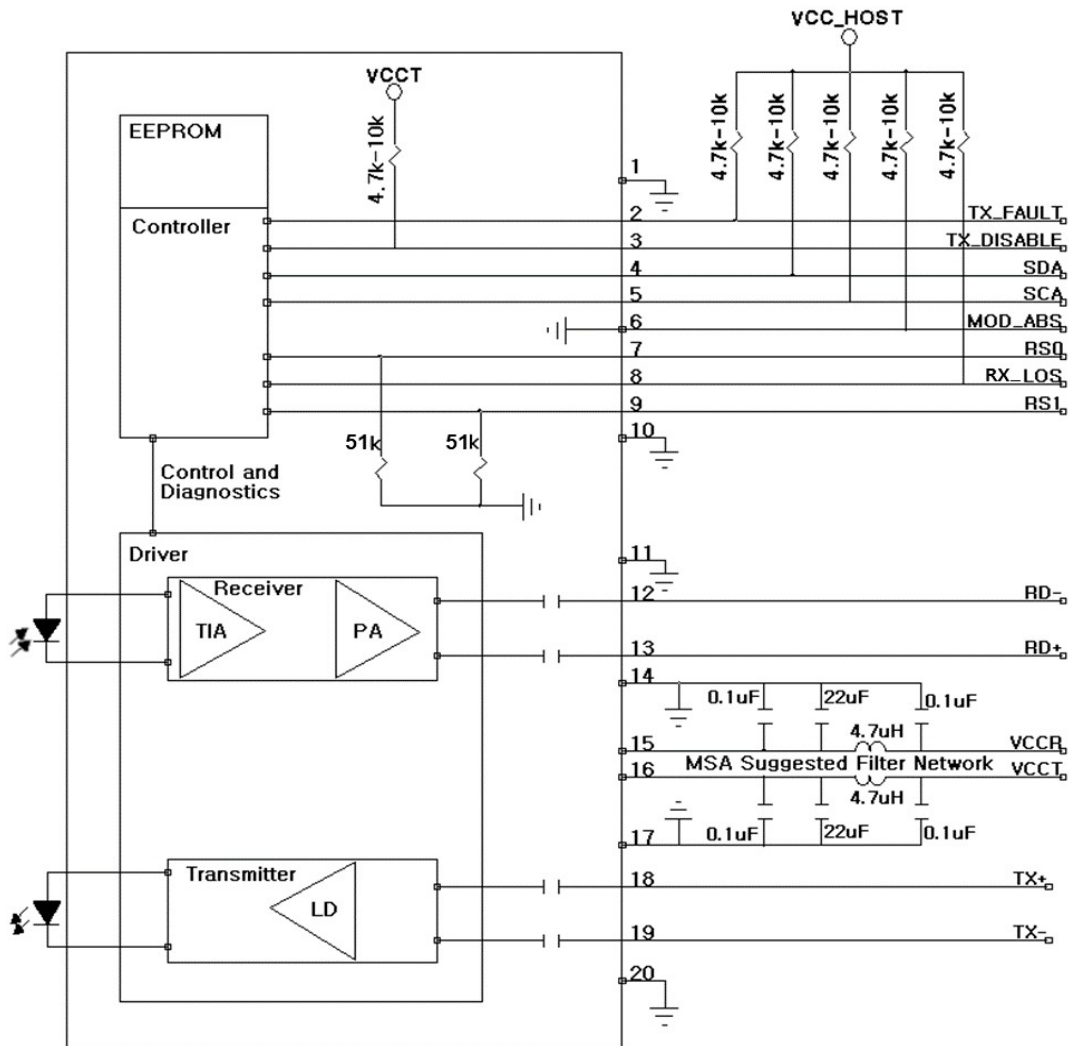
## Pin Descriptions

Pin	Symbol	Name/Description	Plug Seq.	Notes
1	VeeT	Transmitter Ground.	1	
2	Tx_Fault	Transmitter Fault Status Output.	3	
3	Tx_Disable	Transmitter Disable Control Input.	3	
4	SDA	I <sup>2</sup> C Data (Input/Output).	3	
5	SCL	I <sup>2</sup> C Clock (Input/Output).	3	
6	MOD_ABS	Indicates that the module is present. Grounded internally.	3	
7	RS0	Rate Select 0. Internally pulled down. 51k $\Omega$ .	3	
8	Rx_LOS	Receiver Loss of Signal Status Output.	3	
9	RS1	Rate Select 1. Internally pulled down. 51k $\Omega$ .	3	
10	VeeR	Receiver Ground.	1	
11	VeeR	Receiver Ground.	1	
12	RD-	Receiver Inverted Data Output.	3	
13	RD+	Receiver Non-Inverted Data Output.	3	
14	VeeR	Receiver Ground.	1	
15	VccR	Receiver 3.3V Power Supply.	2	
16	VccT	Transmitter 3.3V Power Supply.	2	
17	VeeT	Transmitter Ground.	1	
18	TD+	Transmitter Non-Inverted Data Input.	3	
19	TD-	Transmitter Inverted Data Input.	3	
20	VeeT	Transmitter Ground.	1	

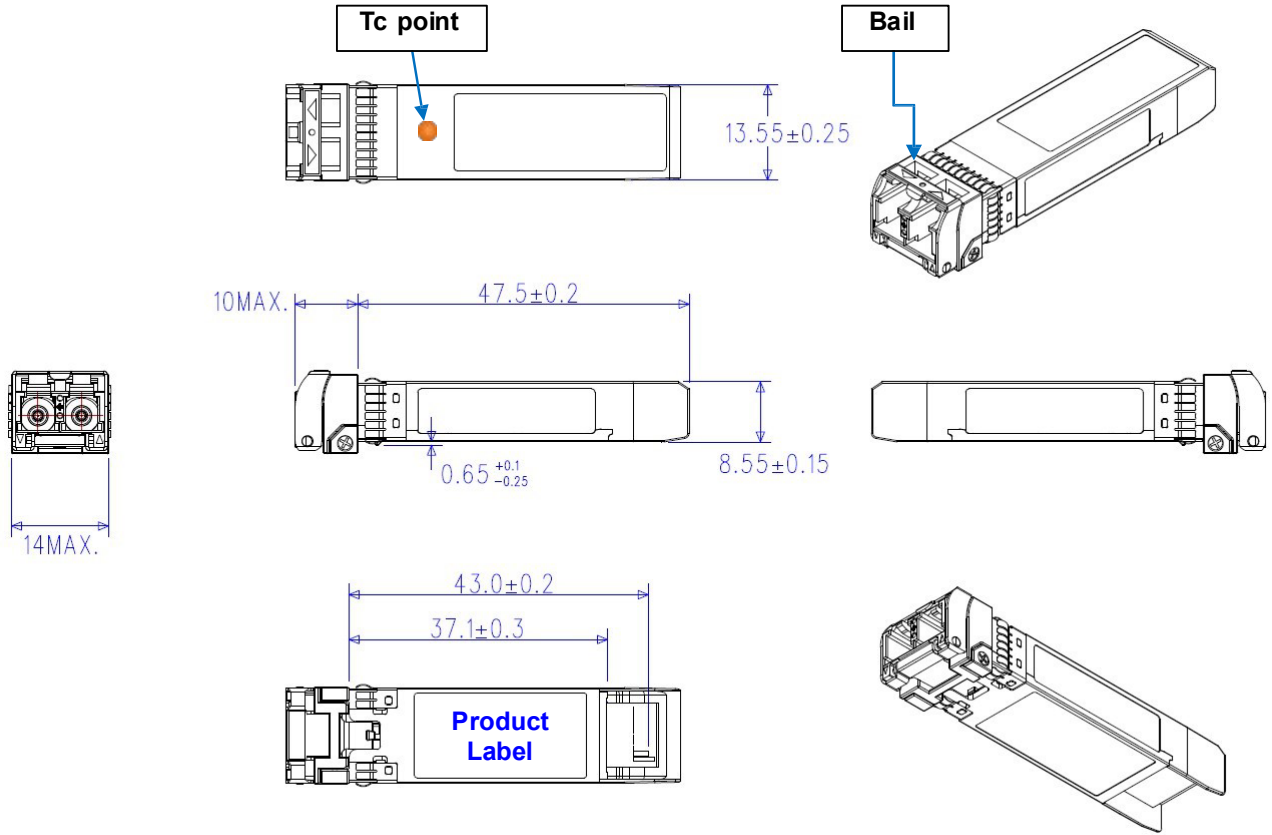
## Pin-Out Details



## Recommended Interface Circuit



# Mechanical Specifications



## About ProLabs

Our extensive experience comes as standard. For over 20 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 more than 100 optical switching and transport platforms.

## A 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 1.6T 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.

## The Trusted Partner

Customer service is our number one value. ProLabs has invested in people, labs and manufacturing capacity to ensure compatible products, and immediate answers to your questions. 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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