

## 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
<b>Power Supply Voltage</b>		3.135	3.3	3.465	Vcc	
<b>Power Dissipation</b>	PC			3.5	W	@3.3V
<b>Power Supply Noise Tolerance</b>	PSNT			66	mVp-p	1
<b>Transmitter</b>						
<b>Differential Input Voltage</b>	VIN	190		700	mV	AC coupled
<b>Differential Input Impedance</b>	ZIN	90	100	110	$\Omega$	
<b>Tx_Disable</b>	<b>Input Low</b>	VIL	-0.3		0.8	V
	<b>Input High</b>	VIH	2.0		Vcc+0.3	V
	<b>Assert Time</b>	tOFF			100	us
	<b>Negate Time</b>	tON			2.0	ms
<b>Tx_Disable to Start Reset</b>	treset	10			us	High
<b>Time to Initialize</b>	tInit			90	s	3
<b>Tx_Fault</b>	<b>Output Low</b>	VFOL	-0.3		0.4	V
	<b>Output High</b>	IFOH	-50		37.5	$\mu$ A
<b>RS1 (Rate Select for Tx)</b>		VIL	-0.3		0.8	V
		VIH	2.0		Vcc+0.3	V
<b>Receiver</b>						
<b>Differential Output Voltage</b>	VOUT	300		850	mV	AC coupled
<b>Differential Output Impedance</b>	ZOUT	90	100	110	$\Omega$	
<b>Rx_LOS (Loss of Signal)</b>	<b>Output Low</b>	VLOSL	-0.3		0.4	V
	<b>Output High</b>	ILOSH	-50		37.5	$\mu$ A
	<b>Assert time</b>	tLOS-ON			100	us
	<b>De-Assert time</b>	tLOS-OFF			100	us
<b>RS0 (Rate Select for Rx)</b>		VIL	-0.3		0.8	V
		VIH	2		Vcc+0.3	V

### Notes:

1. From 10Hz to 10MHz.
2. LVTTL, 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	ΔPO	-1.0		1.0	dB	All channels	
Transmitter Disabled Power	Poff			-30	dBm	1	
Optical Center Wavelength	λC	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	λp_BOL	-1.7	λC	1.7	GHz	3
	End of Life	λp_EOL	-2.5	λC	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	PRBS <sup>2<sup>31</sup>-1</sup>	
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		λo	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:

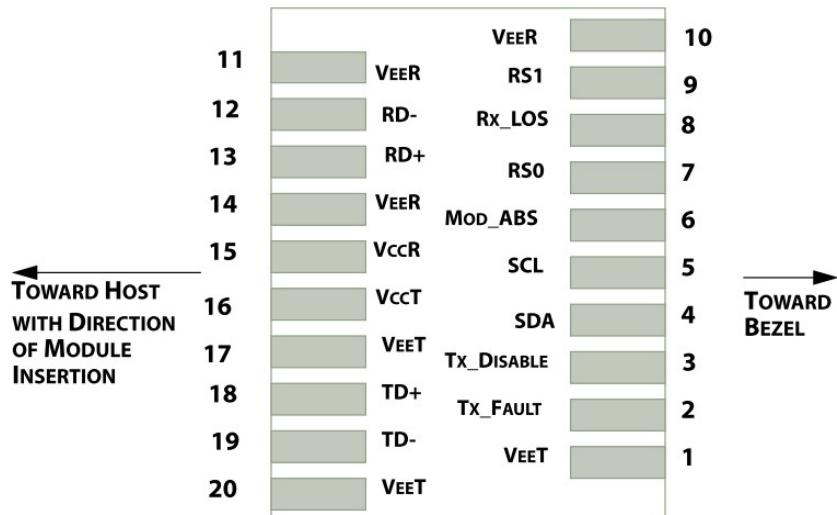
## 1. @Tx Disable is high.

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 5x10<sup>-5</sup>, source ER=8.0dB, SMF 15km, G652.
6. PRBS2<sup>31</sup>, BER 5x10<sup>-12</sup>, source ER=8.0dB, SMF 15km, G652.
7. PRBS2<sup>31</sup>, BER 5x10<sup>-4</sup>, 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.

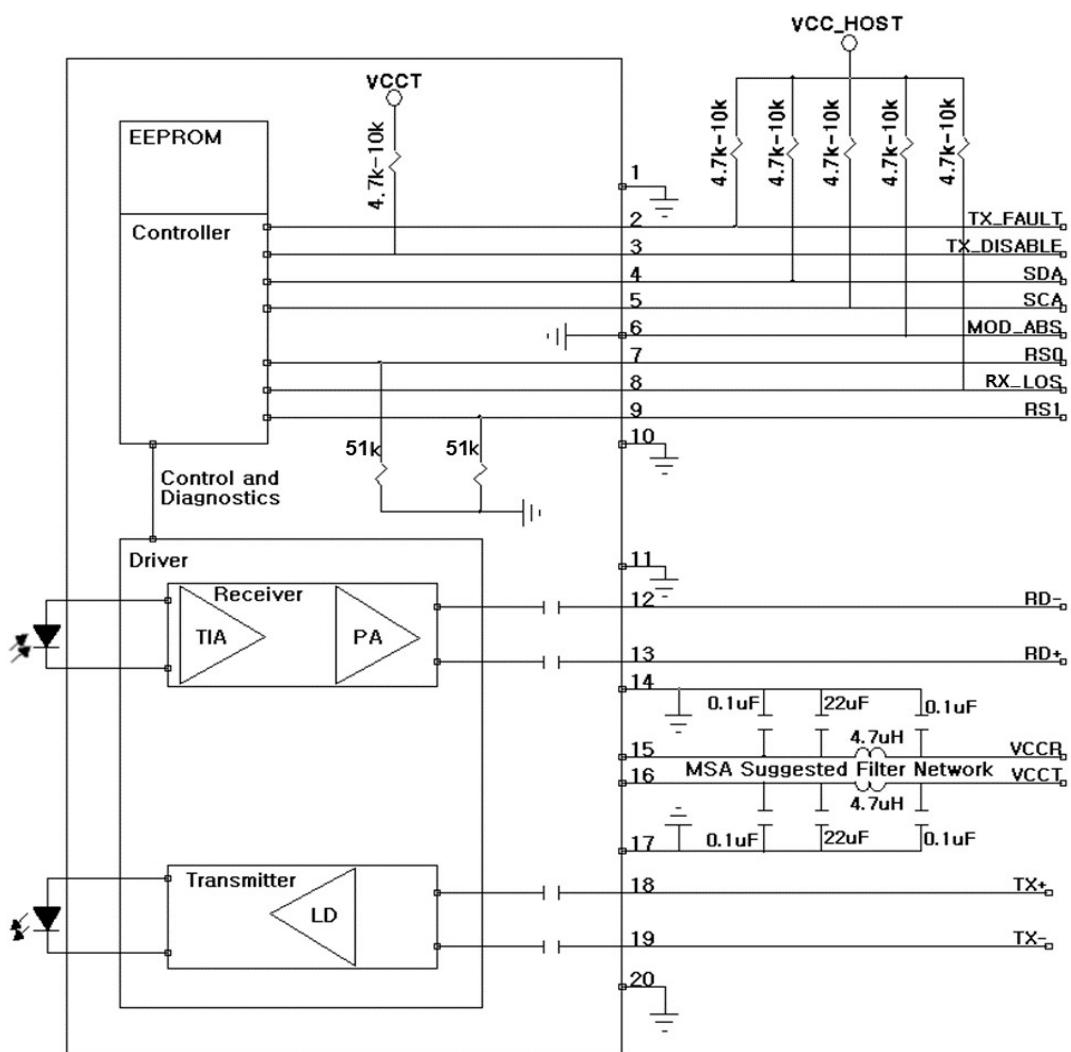
### Pin Descriptions

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

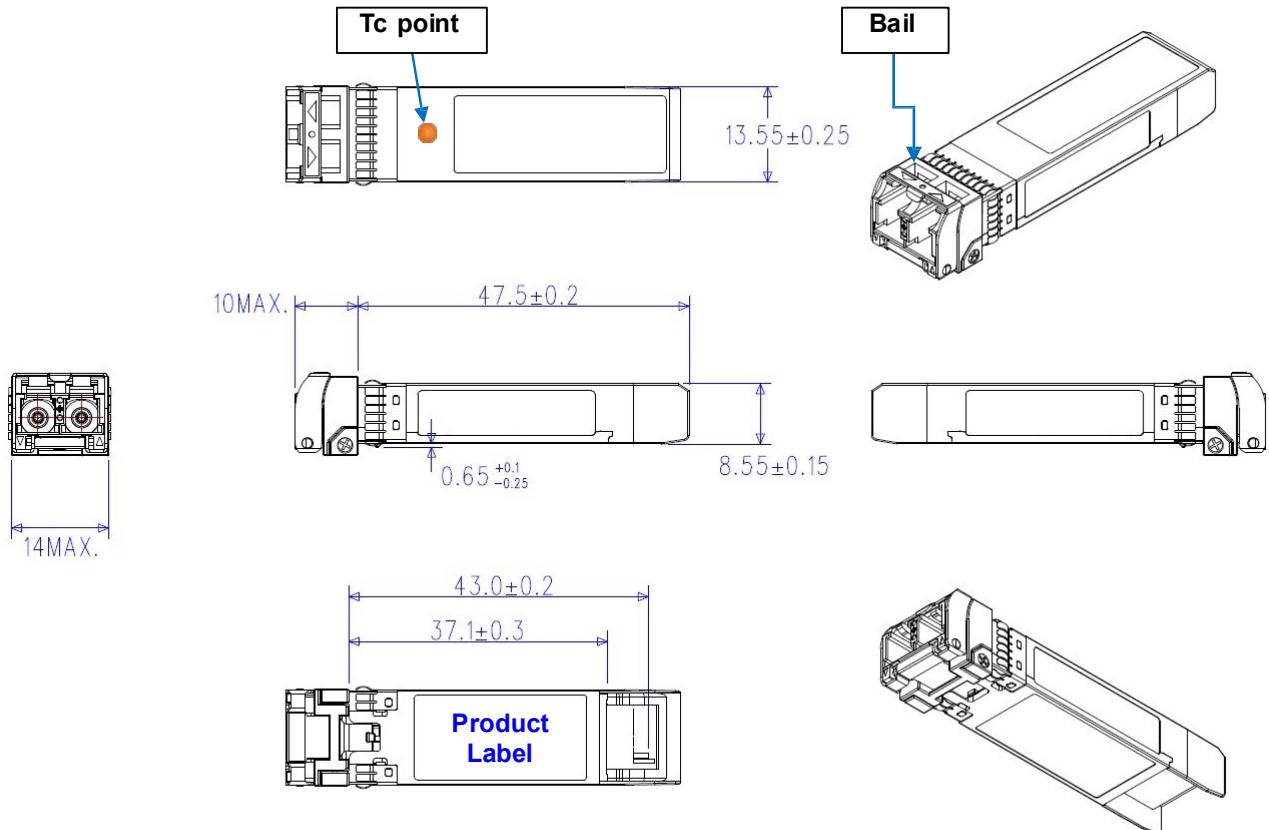
## Pin-Out Details



## Recommended Interface Circuit



## Mechanical Specifications



## 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.



## Contact Information

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