

### **RDH102409/1-C**

LG-Ericsson® RDH102409/1 Compatible TAA 25GBase-DWDM SFP28 Transceiver C-Band 100GHz (SMF, Flex-Tunable, 15km, LC, DOM, -20 to 85C)

#### **Features:**

- Supports 25.78Gbps Ethernet and 24.33Gbps CPRI 10
- Up to 15km link length
- DWDM in 100GHz, ITU-based channel spacing (C-Band)
- Operating temperature: -20 to 85 Celsius
- Monolithic MZM Tunable TOSA
- Retimed Electrical Interface
- Dual LC connector duplex
- Built-in Digital Diagnostic Functions
- Hot Pluggable
- RoHS Compliant and Lead-free



#### **Applications:**

- 25GBase Ethernet

#### **Product Description**

This LG-Ericsson® SFP28 transceiver provides 25GBase-DWDM throughput up to 15km over single-mode fiber (SMF) using a wavelength of Flex-Tunable via an LC connector. It is guaranteed to be 100% compatible with the equivalent LG-Ericsson® 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.

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)
21	192.1	1560.61	41	194.1	1544.53
22	192.2	1559.79	42	194.2	1543.73
23	192.3	1558.98	43	194.3	1542.94
24	192.4	1558.17	44	194.4	1542.14
25	192.5	1557.36	45	194.5	1541.35
26	192.6	1556.55	46	194.6	1540.56
27	192.7	1555.75	47	194.7	1539.77
28	192.8	1554.94	48	194.8	1538.98
29	192.9	1554.13	49	194.9	1538.19
30	193.0	1553.33	50	195.0	1537.40
31	193.1	1552.52	51	195.1	1536.64
32	193.2	1551.72	52	195.2	1535.82
33	193.3	1550.92	53	195.3	1535.04
34	193.4	1550.12	54	195.4	1534.25
35	193.5	1549.32	55	195.5	1533.47
36	193.6	1548.51	56	195.6	1532.68
37	193.7	1547.72	57	195.7	1531.90
38	193.8	1546.92	58	195.8	1531.12
39	193.9	1546.12	59	195.9	1530.33
40	194.0	1545.32	60	196.0	1529.55

## Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Maximum Supply Voltage	Vcc	-0.5		4.0	V	
Storage Temperature	Tstg	-40		85	°C	
Operating Case Temperature	Tc	-20		85	°C	
Cool Start Temperature	Tcs	-40		85		
Storage Relative Humidity	RH	0		85	%	
Receiver Optical Damage Threshold	RxDamage	3			dBm	
Nominal Bit Rate	BR1		25.78125		Gbps	1
	BR2		24.33024		Gbps	1
Bit Rate Tolerance		-100		100	ppm	1
Maximum Supported Link Length	Lmax			15	Km	2

### Notes:

1. Tested with a 2<sup>31</sup>-1 PRBS pattern at the BER.
2. Over G.652 Single-mode fiber.

## Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	Vcc	3.14		3.46	V	
Supply Current	Icc			955	mA	1
Module Total Power Dissipation	P		2.5	3	W	2
<b>Transmitter</b>						
Input Differential Impedance	Rin	80	100	120	$\Omega$	
Differential Data Input Swing	Vin,pp	180		900	mV	3
Transmit Disable Voltage	Vd	Vcc-0.8		Vcc	V	
Transit Enable Voltage	Ven	Vee		Vee+0.8	V	
<b>Receiver</b>						
Output Differential Impedance	Rout	80	100	120	$\Omega$	
Differential Data Output Swing	Vout,pp	100		900	mV	4
Common Mode Return Loss				-2	dB	
LOS Asserted	VLOS_A	Vcc-0.8		Vcc	V	
LOS De-Asserted	VLOS_D	Vee		Vee+0.8	V	
Output rise/fall time		TBD			ps	4,5
Power Supply Noise Tolerance	VccT/VccR	Per SFF_8431 Rev 4.1			mVpp	

### Notes:

1. Compliant with the SFP+ Module Power Requirements.
2. Maximum total power value is specified across the full temperature and voltage range.
3. Connected directly to Tx data input pins.
4. Into 100 $\Omega$  differential termination.
5. 20%-80% Measured with Module Compliance Test Board and OMA test pattern. Use of four 1's and four 0's sequence in the PRBS 9 is an acceptable alternative. SFF\_8431 Rev 4.1.

## Optical Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter							
Average Launch Power		Pave	0	1	3	dBm	
Nominal Optical Center Wavelength		$\lambda_c$ East	1529.55		1560.61	nm	1
Nominal Optical Central Frequency		$f_c$ East	196		192.1	THz	1
Wavelength Tuning Time(Channel-to-Channel)		Ttune			1	s	
Optical Return Loss Tolerance		RL	24			dB	
Side-Mode Suppression Ratio		SMSR	30			dB	
Optical Extinction Ratio			7			dB	
Average Launch Power when Tx is Off		Poff			-30	dBm	
Tx Jitter		Txj1	Per 802.3ae requirements				
Center Wavelength	Beginning of Life	$\lambda_{c\_BOL}$	z-6.25	z	z+6.25	GHz	
	End of Life	$\lambda_{c\_EOL}$	z-12.5	z	z+12.5	GHz	
Receiver at 0ps/nm							
Bit Rate <5E-5		Rsense			-18	dBm	2,3
Overload Average Power		Pave			-8	dBm	
Optical Center Wavelength		$\lambda_c$	1527		1569	nm	
LOS De-Assert		LOSd			-22.5	dBm	
LOS Assert			-34		-23	dBm	
LOS Hysteresis			0.5			dB	
Receiver Reflectance					-27	dB	
Dispersion 232ps/nm @ BER <5E-5		DP		2.5		dB	2,3

### Notes:

1. As per ITU-T 698.4, 20 channel 100GHz spacing.
2. Measured with worst ER=7dB;  $2^{31}$ -1 PRBS; OSNR>30dB with 0.1nm resolution.
3. Measured at 1527-1569nm with worst ER; PRBS31.

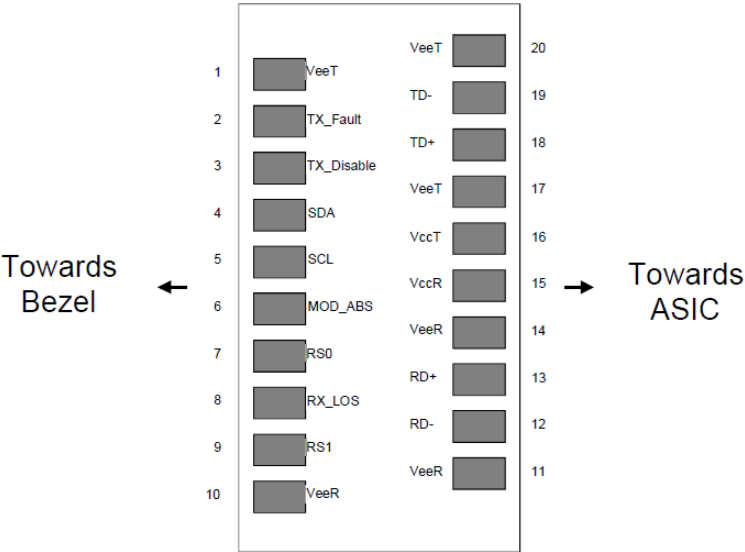
## Pin Descriptions

Pin	Symbol	Name/Description	Notes
1	VeeT	Transmitter Ground.	1
2	Tx_Fault	Transmitter Fault.	2
3	Tx_Dis	Transmitter Disable. Laser output disabled on “high” or “open.”	3
4	SDA	2-Wire Serial Interface Data Line.	2
5	SCL	2-Wire Interface Clock Line.	2
6	MOD_ABS	Module Absent. Grounded within the module.	2
7	RS	Rx Rate Select: Open or Low = 10.3Gbps or 9.8 Gbps (Low Bandwidth) High = 25.78Gbps or 24.33Gbps (High Bandwidth)	5
8	Rx_LOS	Loss of Signal Indication. “logic 0” indicates normal operation.	4
9	RS1	Tx Rate Select: Open or Low = 10.3Gbps or 9.8 Gbps (Low Bandwidth) High = 25.78Gbps or 24.33Gbps (High Bandwidth)	5
10	VeeR	Receiver Ground.	1
11	VeeR	Receiver Ground.	1
12	RD-	Receiver Inverted DATA out. AC coupled.	
13	RD+	Receiver Non-Inverted DATA out. AC Coupled	
14	VeeR	Receiver Ground.	1
15	VccR	Receiver Power Supply.	5
16	VccT	Transmitter Power Supply.	5
17	VeeT	Transmitter Ground.	1
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled.	
19	TD-	Transmitter Inverted DATA in. AC Coupled.	
20	VeeT	Transmitter Ground.	1

## Notes:

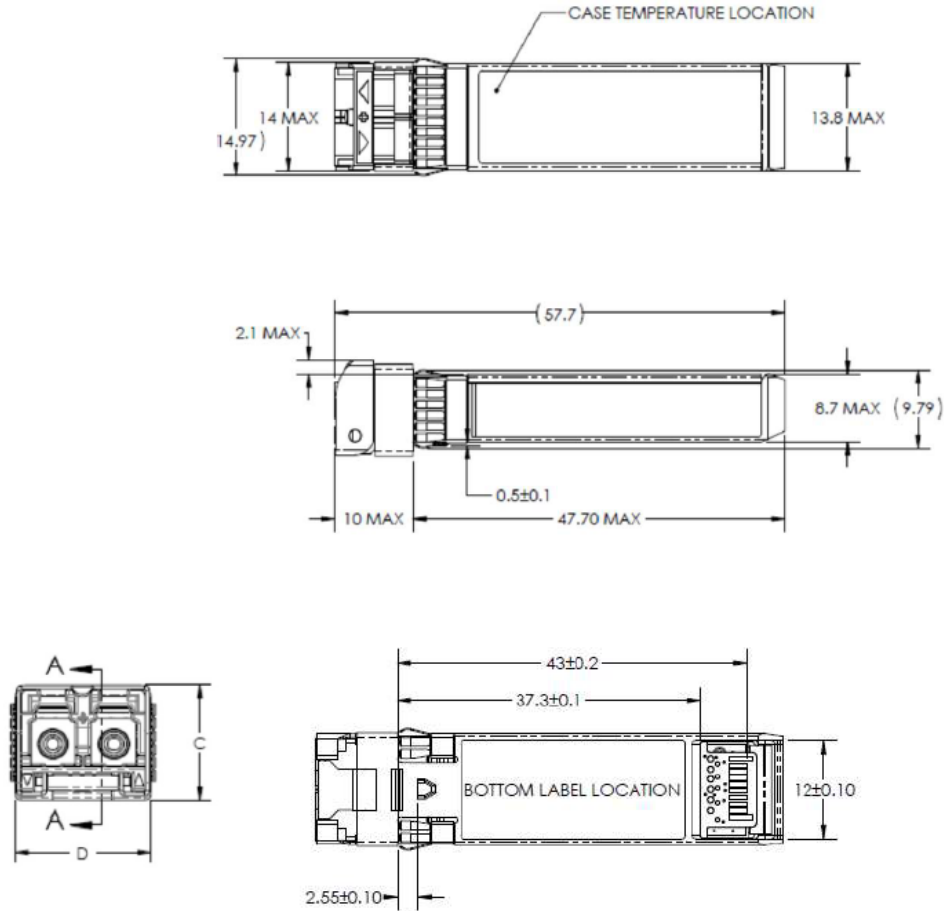
1. Circuit ground is internally isolated from the chassis ground.
2. Tx\_Fault is an open collector/drain output, which should be pulled with a 4.7kΩ - 10kΩ resistor on the host boards if intended for use. Pull up voltage should be between 2.0V to Vcc+0.3V. A “high” output indicated a transmitter fault caused by either the Tx bias current or the Tx output power exceeding the preset alarm threshold. A “low” output indicated normal operation. In the low state, the output is pulled to <0.8V.
3. Laser output disabled on Tdis.2.0V or open, enabled on Tdis<0.8V.
4. LOS is open collector output. Should be pulled with 4.7kΩ - 10kΩ on host board to voltage between 2.0V and 3.6V. Logic 0 indicated normal operation; logic 1 indicated loss of signal.
5. Rate select can also be set through the 2-Wire bus in accordance with Sff-8472 v 12.1c. 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 logic OR of the input state of Rate Select Pin and 2-wire bus.
6. Internally connected.

Electrical Pad Layout



Pin-Out of Connector Block on the Host Board

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.



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