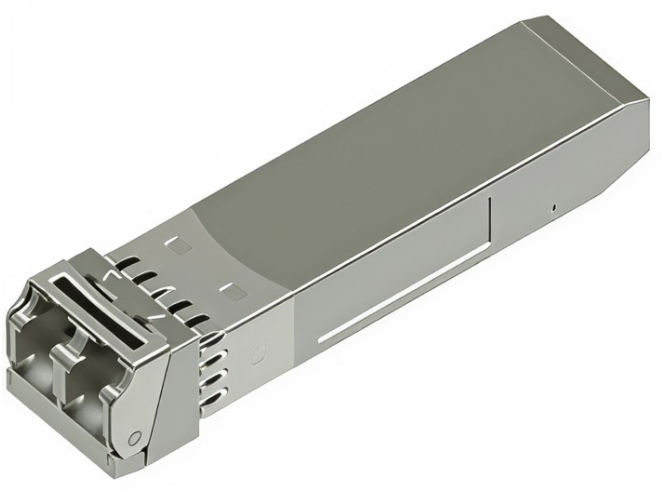
25G SFP28 LR Transceiver

Overview

The Wave2Wave 25G SFP28 LR transceiver delivers high-performance optical connectivity for modern data-center and carrier-grade networks. Engineered for long-reach applications up to 10 km over SMF, it integrates a 1310 nm DFB laser, PIN receiver, and advanced CDR for stable multi-rate operation from 9.95 to 25.78Gbps.

With low power consumption, robust digital diagnostics, and seamless hot-swap capability, it ensures reliable, scalable, and energy-efficient optical links for next-generation infrastructure.



Features and Benefits

- Hot-pluggable SFP28 design with duplex LC interface
- Supports up to 28.05Gbps over 10km on single-mode fiber
- SFI electrical interface ensures reliable host connectivity
- Integrated 2-wire digital diagnostics for real-time monitoring
- Low-power 3.3V operation optimized for dense optical deployments
- Operating case temperature: 0ºC - +70ºC

Applications

- Data-center interconnects
- 25G Ethernet links
- Enterprise and cloud networking
- High-capacity transport and aggregation systems

Absolute Maximum Rating

Parameter	Symbol	Min	Max	Unit
Storage Temperature	Ts	-40	85	ºC
Relative Humidity	RH	5	95	%
Supply Voltage	Vcc3	-0.5	3.6	V
RX Input OMA Power	Pmax		5	dBm

Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Operating Case Temperature	Tc	0	25	70	ºC
Power Supply Voltage	Vcc3	3.135	3.3	3.465	V
	Icc3			400	mA
Power Dissipation	PD		1.2	1.5	W
Data Rate		24.33	25.78		Gbps
Transmission Distance				10	km

Optical Characteristics (Transmitter)						
Parameter	**Symbol**	**Min**	**Typical**	**Max**	**Unit**	**Notes**
Centre Wavelengths	λc	1290	1310	1325	nm	
Side-Mode Suppression Ratio	SMSR	30			dB	
Laser Off Power	Poff			-30	dBm	
Average Optical Power	Pavg	-4.5		4.5	dBm	
Extinction Ratio	ER	4			dB	
Relative Intensity Noise	Rin			-130	dB/Hz	
Optical Return Loss Tolerance		12			dB	
Transmitter Dispersion Penalty				27	dB	
Date Rate		24.33	25.78		Gbps	Note 1
Optical Eye Mask	>5% (Compatible 100GBASE-LR4)					Note 2
Common Mode Voltage Tolerance		15			mV	
Tx Input Diff Voltage	VI	200	500	900	mV	
Tx Fault	VOL			0.4	V	Note 3
	VOH	VccT-0.4				

NOTES:

1. Under CDR bypass mode, CPRI option 7 compatibility
2. 1000 consecutive snapshots at typical rate and room temperature
3. Measured with a 4.7k Ohm load pulled up to Vcc

Optical Characteristics (Receiver)						
Parameter	**Symbol**	**Min**	**Typical**	**Max**	**Unit**	**Notes**
Centre Wavelengths	λr	1260	1310	1360	nm	
Data Rate		24.33	25.78		Gbps	Note 2
Receiver Sensitivity (OMA), each lane				-14	dBm	Note 1
LOS Assert	LosA	-30			dBm	
LOS De-Assert	LosD			-13	dBm	
LOS Hysteresis	LosH	0.5			dB	
Overload (OMA)	Pin	4.5			dBm	
Receiver Reflectance				-26	dB	
Rx Output Diff Voltage	Vo		500	900	mV	
Rx Output Rise and Fall Time	Tr/Tf	9.5			ps	

NOTES:

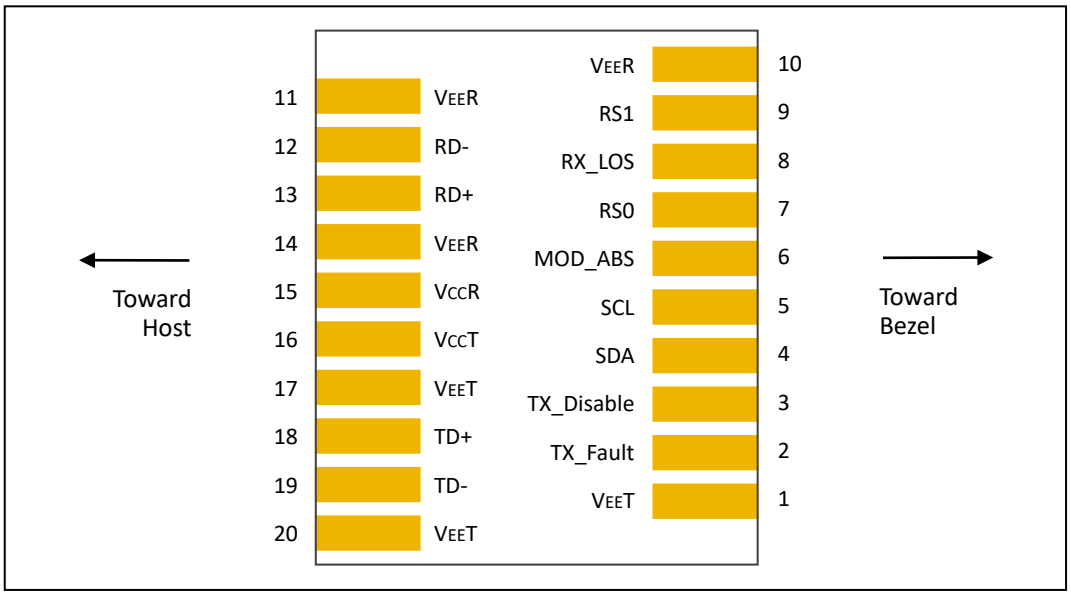
1. Measured with 25.78125Gb/s, PRBS-31 NRZ, ER>4dB, 1260~1360nm, BER 5E-5
2. Under CDR bypass mode, CPRI option 7 compatibility

Control and Status I/O Timing						
Parameter	**Symbol**	**Min**	**Typical**	**Max**	**Unit**	**Notes**
TX Disable Assert Time	t_off			100	µs	Note 1
TX Disable Negate Time	t_on			2	ms	Note 2
Time to Initialize Including Reset of TX_Fault	t_init			300	ms	Note 3
TX Fault Assert Time	t_fault			1	ms	Note 4
TX Fault Reset Time	t_reset	10			µs	Note 5
LOS Assert Time	t_loss_on			100	µs	Note 6
LOS De-Assert Time	t_loss_off			100	µs	Note 7
Rate-Select Change Time	t_ratesel			10	µs	Note 8
Serial ID Clock Rate	f_serial_clock	0.001		400	kHz	

NOTES:

1. Time from rising edge TX Disable to when the optical output falls below 10% of nominal.
2. Time from falling edge TX Disable to when the modulated optical output rises above 90% of nominal.
3. From power on or negation of TX Fault using TX Default.
4. Time from fault to TX fault on.
5. Time TX Disable must be held high to reset TX_fault.
6. Time from LOS state to RX LOS assert.
7. Time from non-LOS state to RX LOS de-assert.
8. Time form rising or falling edge of Rate Select input until receiver bandwidth is in conformance with appropriate specification.

Pin-Out Definition



Pin Description				
Pin	**Name**	**Symbol**	**Description**	**Notes**
1		VeeT	Module Transmitter Ground	Note 1
2	LVTTL-O	TX_Fault	Module Transmitter Fault	Note 2
3	LVTTL-I	TX_Disable	Transmitter Disable; Turns off transmitter laser output	Note 3
4	LVTTL-I/O	SDA	2-Wire Serial Interface Data Line (Same as MOD-DEF2 as defined in the INF-8074i)	Note 4
5	LVTTL-I/O	SCL	2-Wire Serial Interface Clock (Same as MOD-DEF1 as defined in the INF-8074i)	Note 4
6		MOD_ABS	Module Absent, connected to VeeT or VeeR in the module	Note 5
7	LVTTL-I	RS0	Not Used	
8	LVTTL-O	RX_LOS	Receiver Loss of Signal Indication (in FC designated as RX_LOS, in SONET designated as LOS, and in Ethernet designated at Signal Detect)	Note 2
9	LVTTL-I	RS1	Not Used	
10		VeeR	Module Receiver Ground	Note 1
11		VeeR	Module Receiver Ground	Note 1
12	CML-O	RD-	Receiver Inverted Data Output	
13	CML-O	RD+	Receiver Non-Inverted Data Output	
14		VeeR	Module Receiver Ground	Note 1
15		VccR	Module Receiver 3.3 V Supply	
16		VccT	Module Transmitter 3.3 V Supply	
17		VeeT	Module Transmitter Ground	Note 1
18	CML-I	TD+	Transmitter Non-Inverted Data Input	
19	CML-I	TD-	Transmitter Inverted Data Input	
20		VeeT	Module Transmitter Ground	Note 1

NOTES:

1. The module signal ground pins, VeeR and VeeT, shall be isolated form the module case.
2. This pin is an open collector/drain output pin and shall be pulled up with 4.7k-10k ohms to host_Vcc on the host board. Pull ups can be connected to multiple power supplies, however the host board design shall ensure that no module pin has voltage exceeding module VccT/R + 0.5 V.
3. This pin is an open collector/drain input pin and shall be pulled up with 4.7k-10k ohms to VccT in the module.
4. See sff-8431 4.2 2-wire Electrical Specifications.
5. This pin shall be pulled up with 4.7k-10k ohms to Host_Vcc on the host board.

Standards Compliance

- FCC 47 CFR Part 15, Class B
- IEEE 802.3-2012
- MSA SFF-8472
- MSA SFF-8431
- RoHS

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