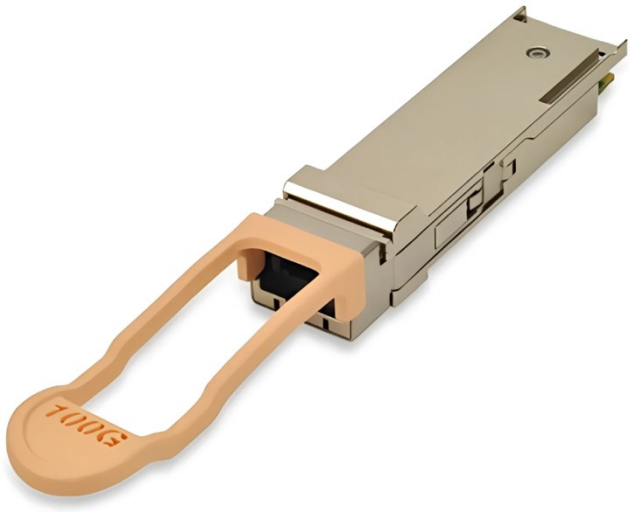
100G QSFP28 LR4 Transceiver

Overview

The Wave2Wave 77-Z010L4 is a hot-pluggable 100G QSFP28 LR4 optical transceiver engineered for long-reach links up to 10 km over single-mode fiber. It delivers four 25.78125 Gbps lanes using cooled LAN-WDM optics that ensure wavelength stability and consistent optical performance.

The module integrates an EEPROM that supports real-time monitoring, diagnostics, and configuration through a standard two-wire QSFP management interface. Designed for modern high-density networks, it provides reliable, high-speed connectivity for data center, enterprise, and carrier applications.



Features and Benefits

- Hot-pluggable QSFP28 MSA package with duplex LC receptacle
- 4×25G lanes supporting 25.78125 Gbps each, up to 10 km over SMF
- 4×25G retimed electrical interface for enhanced signal integrity
- Single +3.3V power supply, consuming <4.5 W
- Operating case temperature range: 0°C to +70°C

Applications

- High-performance computing, server data links
- 100GBASE-LR4 Ethernet links

Absolute Maximum Rating

Parameter	Symbol	Min	Max	Unit
Storage Temperature	Ts	-40	85	ºC
Relative Humidity	Rh	0	85	%
Supply Voltage	Vcc3	-0.5	3.6	V
Receiver Damage Threshold, per Lane	PT		5.5	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			1.36	A
Power Dissipation	PD			4.5	W
Data Rate (NRZ) per Lane			25.78125		Gbps
Data Rate (NRZ) Total			103.125		Gbps
Transmission Distance				10	km

Optical Characteristics (Transmitter)						
Parameter		**Symbol**	**Min**	**Typical**	**Max**	**Unit**
Centre Wavelengths, each Lane	CH0	λ0	1294.53	1295.53	1296.59	nm
	CH1	λ1	1299.02	1300.05	1301.09	nm
	CH2	λ2	1303.54	1304.58	1305.63	nm
	CH3	λ3	1308.09	1309.14	1310.19	nm
Side-Mode Suppression Ratio		SMSR	30			dB
Transmit OMA, per Lane		OMA	-1.3		4.5	dBm
Extinction Ratio		ER	4			dB
Difference in Power Between Any Two Lanes		$P_{tx,\,diff}$			5	dB
Relative Intensity Noise		Rin			-128	dB/Hz
Optical Return Loss Tolerance					20	dB
Average Launch Power per Lane		P_{avg}	-4.3		4.5	dBm
Total Average Launch Power		PT			10.5	dBm
Average Launch Power of OFF Transmitter, per lane		P_{off}			-30	dBm
Transmitter and Dispersion Penalty per Lane					2.2	dB
Transmitter Reflectance		Rr			-12	dB
Operating Data Rate, per Lane				25.78125		Gbps
Operating Date Rate, Total				103.125		Gbps
Optical Eye Mask Margin		>5%				
Transmitter Eye Mask Definition (X1, X2, X3, Y1, Y2, Y3)		(0.31, 0.4, 0.45, 0.34, 0.38, 0.4)				

Optical Characteristics (Receiver)						
Parameter		**Symbol**	**Min**	**Typical**	**Max**	**Unit**
Centre Wavelengths, each Lane	CH0	λ0	1294.53	1295.53	1296.59	nm
	CH1	λ1	1299.02	1300.05	1301.09	nm
	CH2	λ2	1303.54	1304.58	1305.63	nm
	CH3	λ3	1308.09	1309.14	1310.19	nm
Damage Threshold per Lane		THd	5.5			dBm
Average Receive Power, each Lane			-10.6		4.5	dBm
Difference in Receive Power Between Any Two Lanes (OMA)		$P_{rx,\,diff}$			5.5	dB
Receive Sensitivity (OMA), each Lane		SEN			-8.6	dBm
Stressed Receive Sensitivity (OMA), each Lane [1]					-6.8	dBm
LOS Assert		LosA	-24			dBm
LOS De-Assert		LosD			-10.8	dBm
LOS Hysteresis		LosH	0.5			dB
Overload (OMA)		Pin			4.5	dBm
Receiver Reflectance					-26	dB
Operating Data Rate, per Lane				25.78125		Gbps
Operating Data Rate, Total				103.125		Gbps
Receiver Electrical 3 dB Upper Cutoff Frequency, each lane		Fc			31	GHz

NOTES:

1. Measured with 25.78125Gb/s, PRBS31 NRZ, BER=1E-12

Electrical Characteristics					
Parameter	**Symbol**	**Min**	**Typical**	**Max**	**Unit**
Receiver Differential Data Output Impedance			100		Ω
Differential Data Input Swing		300		900	mV
Differential Data Output Swing		400		900	mV

Control and Status I/O Timing					
Parameter	**Symbol**	**Min**	**Typical**	**Max**	**Unit**
Initialization Time	t_init			2000	ms
Reset Init Assert Time	t_reset_init			2	us
Serial Bus Hardware Ready Time	t_serial			2000	ms
Reset Assert Time	t_reset			2000	ms
LPMode Assert Time	ton_LPMode			100	us
LPMode De-Assert Time	toff_LPMode			300	ms
IntL Assert Time	ton_IntL			200	ms
IntL De-Assert Time	toff_IntL			500	us
Rx LOS Assert Time	ton_los			100	ms
Tx Fault Assert Time	ton_Txfault			200	ms
Flag Assert Time	ton_flag			200	ms
Mask Assert Time	ton_mask			100	ms
Mask De-Assert Time	toff_mask			100	ms
Power_override or Power_set Assert Time	ton_Pdown			100	ms
Power_override or Power_set De-Assert Time	toff_Pdown			300	ms

Pin-Out Definition

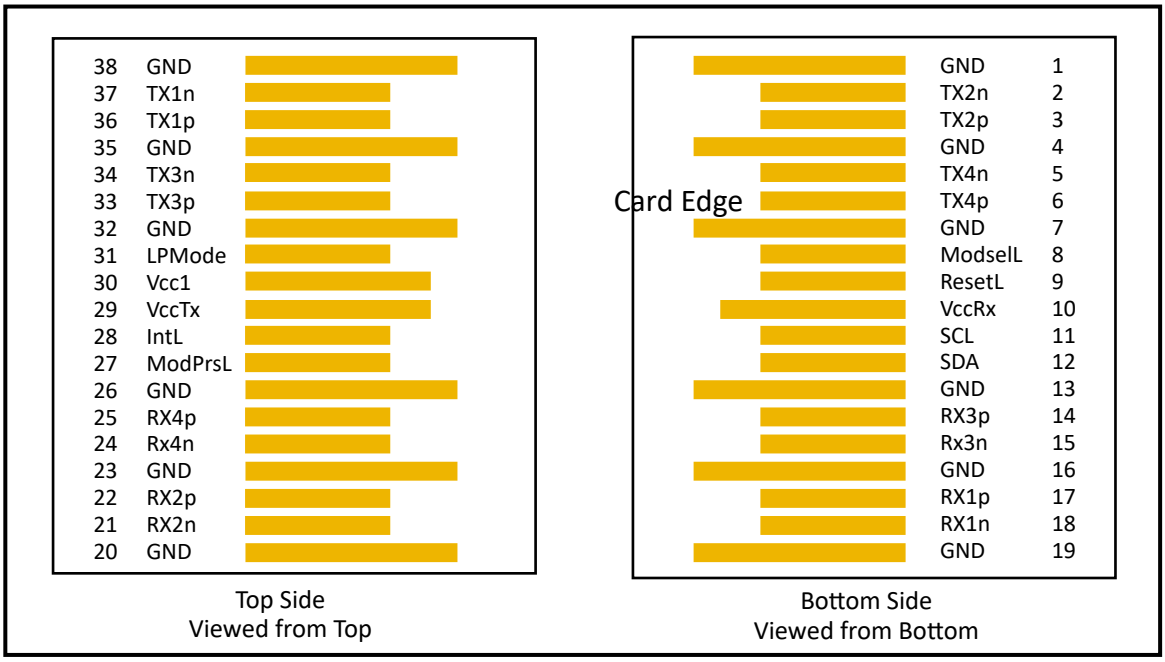


Figure 1. Pin Map

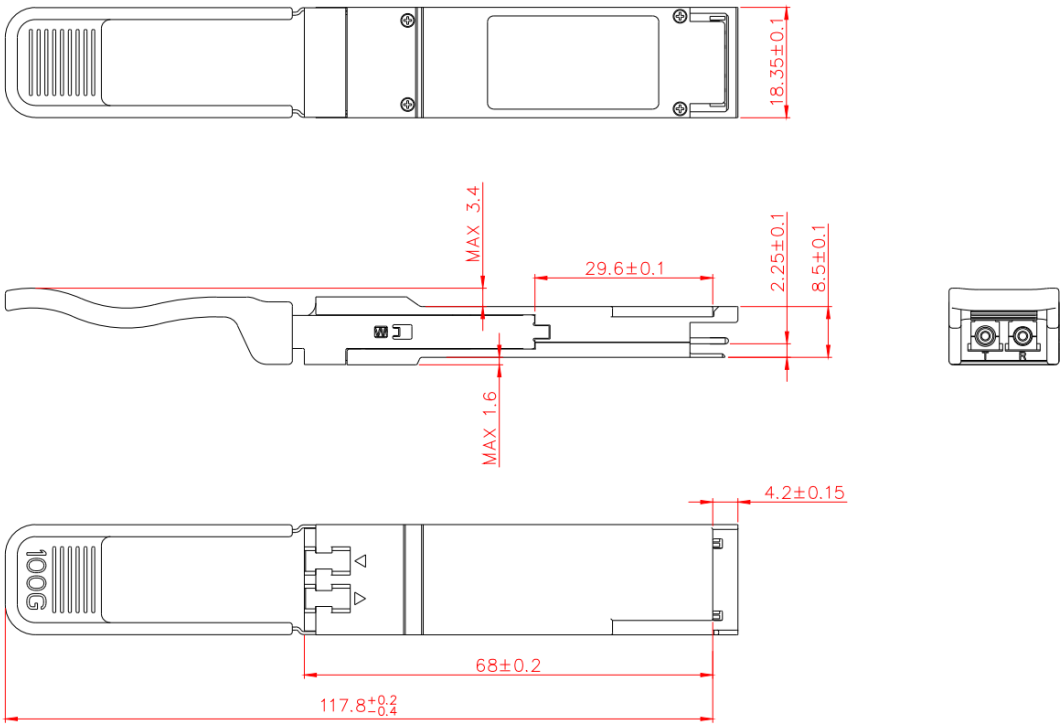
Pin	Name	Description
1	GND	Module Ground
2	Tx2n	Transmitter Inverted Data Input
3	Tx2p	Transmitter Non-Inverted Data Input
4	GND	Module Ground
5	Tx4n	Transmitter Inverted Data Input
6	Tx4p	Transmitter Non-Inverted Data Input
7	GND	Module Ground
8	ModSelL	Module Select
9	ResetL	Module Reset
10	VccRx	+3.3V Power Supply Receiver
11	SCL	2-Wire serial Interface Clock
12	SDA	2-Wire serial Interface Data
13	GND	Module Ground
14	Rx3p	Receiver Non-Inverted Data Output
15	Rx3n	Receiver Inverted Data Output
16	GND	Module Ground
17	Rx1p	Receiver Non-Inverted Data Output
18	Rx1n	Receiver Inverted Data Output
19	GND	Module Ground
20	GND	Module Ground
21	Rx2n	Receiver Inverted Data Output
22	Rx2p	Receiver Non-Inverted Data Output
23	GND	Module Ground
24	Rx4n	Receiver Inverted Data Output
25	Rx4p	Receiver Non-Inverted Data Output
26	GND	Module Ground
27	ModPrsL	Module Present
28	IntL	Interrupt
29	VccTx	+3.3V Power Supply Transmitter
30	Vcc1	+3.3V Power Supply
31	LPMode	Low Power Mode
32	GND	Module Ground
33	Tx3p	Transmitter Non-Inverted Data Output
34	Tx3n	Transmitter Inverted Data Output
35	GND	Module Ground
36	Tx1p	Transmitter Non-Inverted Data Input
37	Tx1n	Transmitter Inverted Data Input
38	GND	Module Ground

Digital Diagnostic Monitor Accuracy

The following characteristics are defined over recommended operating conditions

Parameter	Accuracy	Unit
Internally measured transceiver temperature	+/-3	deg.C
Internally measured transceiver supply voltage	+/-3	%
Measured Tx bias current	+/-10	%
Measured Tx output power	+/-3	dB
Measured Rx received average optical power	+/-3	dB

Outline Dimensions



Standards Compliance

- IEEE 802.3ba 100GBASE-LR4
- IEEE 802.3bm
- QSFP28 MSA
- SFF-8636
- RoHS

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