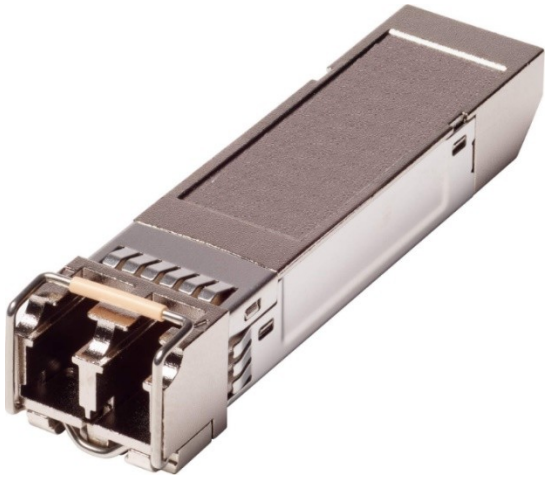
1.25G SFP SX Transceiver

Overview

The Wave2Wave 1.25G SFP SX Transceiver is a compact, hot-pluggable optical module designed for short-reach Gigabit Ethernet and Fiber Channel applications. Operating at 850 nm with a high-performance VCSEL transmitter, it supports transmission distances up to 550 m on 50/125 µm MMF and 300 m on 62.5/125 µm MMF. Fully compliant with IEEE 802.3z, 1000BASE-SX, and the SFP MSA, the module delivers stable, low-latency connectivity for enterprise, campus, and data-center access networks. Integrated digital diagnostics (DDM) provide real-time monitoring to ensure reliable operation across the 0°C to 70°C commercial temperature range.



Features & Benefits

- Supports 1.25G GE and 1.063G FC with full SFP MSA and IEEE 802.3z compliance.
- 850 nm VCSEL and duplex LC interface for MMF links up to 550 m.
- Hot-pluggable SFP design with integrated digital diagnostics (DDM).
- Operates on a single 3.3V supply with low power use.
- RoHS compliant and certified Class 1 laser for safe operation.

Applications

- Gigabit Ethernet (1.25G)
- Fiber Channel (1.063G)
- Enterprise and campus switching
- Short-reach data center and server connections
- Industrial and embedded optical networking systems

Ordering information

Part Number	Transmitter	Output Power	Receiver	Sensitivity	Reach	Temp	DDM	RoHS
77-S010-LX	850nm VCSEL	-9.5~ 0dBm	PIN	< -23dBm	550m	0 ~ 70ºC	Available	Compliant

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Storage Temperature	Ts	-40		85	ºC	1
Relative Humidity	Rh	5		95	%	
Supply Voltage	Vcc	-0.5		4.0	V	

NOTES:

1. Ambient temperature

Recommended Operating Conditions						
Parameter	**Symbol**	**Min.**	**Typical**	**Max.**	**Unit**	**Notes**
Data Rate	DR		1.25		Gb/s	1
	DR		1.062		Gb/s	2
Bit Error Rate	BER			10^{-12}		
Operating Temperature	Tc	-40		85	°C	3
Supply Current	ICC		130	180	mA	4
Input Voltage	VCC	3.14	3.3	3.46	V	

NOTES:
1. IEEE 802.3
2. FC-PI-2 Rev5
3. Case temperature
4. For electrical power interface

Transmitter Optical Characteristics						
Parameter	**Symbol**	**Min.**	**Typical**	**Max.**	**Unit**	**Notes**
Output Optical Power	Pout	-9.5		0	dBm	1
Optical Center Wavelength	λC	830		860	nm	
Extinction Ratio@1.25Gb/s	ER	9			dB	
Tx Disabled Power	PTX_DIS			-30	dBm	
Spectral Width (RMS)	Δλ			0.85	nm	
Optical Rise/Fall Time (20%-80%)	tr/tf		100	150	ps	
Relative Intensity Noise	RIN			-120	dB/Hz	
Generated Jitter (peak to peak)	GJPP			0.16	UI	
Mask Margin			20		%	2
Optical Return Loss Tolerance	TORL			12	dB	
Transmitter Dispersion Penalty	TDP			2	dB	

NOTES:
1. Average
2. Compliant with IEEE802.3z standard

Receiver Optical Characteristics						
Parameter	**Symbol**	**Min.**	**Typical**	**Max.**	**Unit**	**Notes**
Receiver Overload	POL	0			dBm	
Optical Center Wavelength	λC	770		860	nm	
Receiver Sensitivity @ 1.063Gb/s				-23	dBm	1
Receiver Sensitivity @ 1.25Gb/s				-23	dBm	2
Receiver Sensitivity OMA	SOMA			-21	dBm	
Receiver Reflectance	RREFL			-12	dB	
Receiver Electrical 3dB Upper cutoff frequency				1500	MHz	
LOS Assert	LOS-A	-30			dBm	
LOS De-Assert	LOS-D			-23	dBm	
LOS Hysteresis	LOS-H	0.5			dB	
Generated Jitter (peak to peak)	RJp-p			0.16	UI	

NOTES:

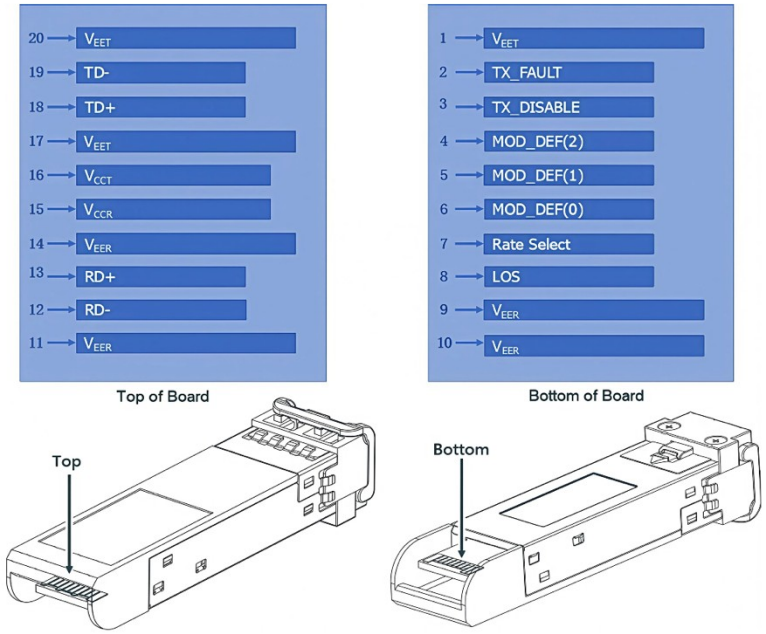
1. FC-PI-2 Rev.5
2. IEEE802.3

Transceiver Electrical Characteristics							
Parameter		**Symbol**	**Min.**	**Typical**	**Max.**	**Unit**	**Notes**
Transmitter							
Input differential impedance		RIN		100		Ω	
Single ended data input swing		VINPP	250		1200	mV	
Transmit disable voltage		VD	VCC-1.3		VCC	V	
Transmit enable voltage		VEN	VEE		VEE+0.8	V	
Transmit disable assert time					10	*μs*	
Receiver							
Single ended data output swing		VOUT PP	300		800	mV	
Data output rise/fall time (20%-80%)		tr/tf			300	*PS*	
RX_LOS	Loss of signal (LOS)	VOH	VCC-0.5		VCC_HOST	V	
	Normal Operation	VOL	VEE		VEE+0.5	V	

Pin Description			
Pin	**Name**	**Description**	**Notes**
1	VEET	Transmitter ground (common with receiver ground)	1
2	TX_FAULT	Transmitter Fault. Not supported	
3	TX_DISABLE	Transmitter Disable. Laser output disabled on high or open	2
4	MOD_DEF(2)	Module Definition 2. Data line for serial ID	3
5	MOD_DEF(1)	Module Definition 1. Clock line for serial ID	3
6	MOD_DEF(0)	Module Definition 0. Grounded within the module	3
7	Rate Select	No connection required	
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation	4
9	VEER	Receiver ground (common with transmitter ground)	1
10	VEER	Receiver ground (common with transmitter ground)	1
11	VEER	Receiver ground (common with transmitter ground)	1
12	RD-	Receiver Inverted DATA out. AC coupled	
13	RD+	Receiver Non-inverted DATA out. AC coupled	
14	VEER	Receiver ground (common with transmitter ground)	1
15	VCCR	Receiver power supply	
16	VCCT	Transmitter power supply	
17	VEET	Transmitter ground (common with receiver ground)	1
18	TD+	Transmitter Non-Inverted DATA in. AC coupled	
19	TD-	Transmitter Inverted DATA in. AC coupled	
20	VEET	Transmitter ground (common with receiver ground)	1

NOTES:

1. Circuit ground is isolated from chassis ground
2. Disabled: TDIS>2Vor open, Enabled: TDIS<0.8V
3. Should Be pulled up with 4.7k –10k ohm on host board to a voltage between 2V and 3.6V



References

1. IEEE standard 802.3. IEEE StandardDepartment,2002.
2. Small Form Factor Pluggable (SFP) Transceiver Multi-Source Agreement (MSA), September2000.
3. Fiber Channel Draft Physical Interface Specification (FC-PI-2Rev.5).
4. Digital Diagnostics Monitoring Interface for Optical Transceivers –SFF-8472.