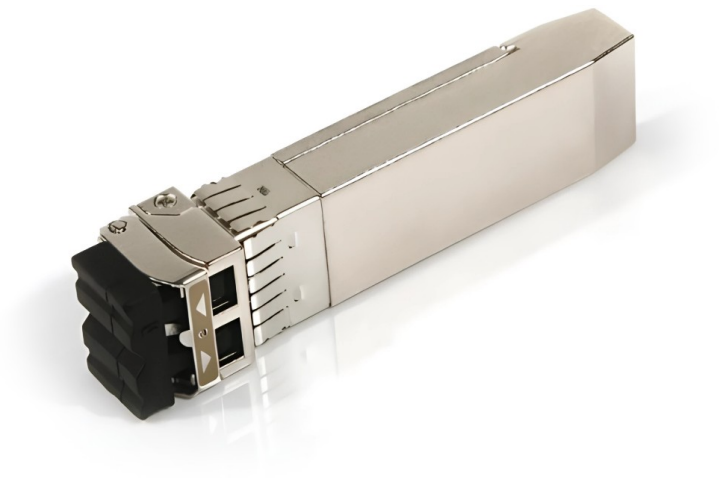
25G SFP28 SR Transceiver

Overview

The 25G SFP28 SR transceiver is engineered for high-performance, short-reach optical connectivity in next-generation data centers and transport networks. It supports data rates up to 28.05Gbps and delivers reliable operation up to 70m on OM3 multimode fiber. The optical design integrates a 25G 850nm VCSEL, PIN receiver, and CDR for stable, low-latency transmission. This hot-pluggable module includes a digital diagnostics interface, enabling real-time monitoring of key performance parameters for simplified operations and maintenance.



Features and Benefits

- Hot-pluggable SFP28 MSA form factor
- Supports 28.05Gbps and reaches 70m over OM3 MMF
- Robust SFI electrical interface
- Integrated 2-wire Digital Diagnostics and monitoring
- Efficient +3.3V power design consuming under 1W
- Wide operating temperature range: –40°C to +85°C

Applications

- High-speed storage and fabric networks
- Data center switching and aggregation
- Wireless and edge access networks

Absolute Maximum Rating

Parameter	Symbol	Min	Max	Unit
Storage Temperature	Ts	-40	+85	ºC
Relative Humidity	RH	5	85	%
Supply Voltage	V_{CC3}	0	3.6	V
RX Input Average Power	Pmax		3.4	dBm

Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Operating Case Temperature	Tc	-40		85	ºC
Power Supply Voltage	V_{CC3}	3.13	3.3	3.47	V
	Icc3			289	mA
Power Dissipation	P_D			1	W
Data Rate			25.78125		Gbps
Transmission Distance (OM3)				70	km

Optical Characteristics (Transmitter)						
Parameter	**Symbol**	**Min**	**Typical**	**Max**	**Unit**	**Notes**
Centre Wavelengths	λc	840	850	860	nm	
Spectral Width	Δλ			0.6	nm	
Laser Off Power	Poff			-30	dBm	
Average Optical Power	Pavg	-8.4		2.4	dBm	
Optical Modulation Amplitude	OMA	-6.4		3	dBm	
Extinction Ratio	ER	2			dB	
Differential Input Impedance			100		Ω	
Optical Return Loss Tolerance				12	dB	
Transmitter Dispersion Penalty	TDP			4.3	dB	
Optical Eye Mask		5			%	
Tx Input Diff Voltage	VI	180		700	mV	
Tx Fault	VOL	-0.3		0.4	V	At 0.7mA
	IOH	-50		37.5	uA	Note 1
Tx Disable	VIL	-0.3		0.8	V	
	VIH	2		VCC+0.3	V	

NOTES:

1. Measured with a 4.7 kΩ load pulled up to Vcc.

Optical Characteristics (Receiver)						
Parameter	**Symbol**	**Min**	**Typical**	**Max**	**Unit**	**Notes**
Centre Wavelengths	λr	840	850	860	nm	
Receiver Sensitivity in Average Power	Psen			-10.3	dBm	Note 1
LOS Assert	LosA	-30			dBm	
LOS De-Assert	LosD			-13	dBm	
LOS Hysteresis	LosH	0.5			dB	
Overload (OMA)	Pin	2.4			dBm	
Receiver Reflectance				-12	dB	
Rx Output Diff Voltage	Vo	300		900	mV	
Rx_LOS	VOL	-0.3		0.4	V	At 0.7 mA
	IOH	-50		37.5	uA	Note 2
RS0, RS1	VIL	-0.3		0.8	V	
	VIH	2		VCC+0.3	V	

NOTES:

1. Receiver sensitivity is informative. Shall be measured with conformance test signal for BER = $5x10^{-5}$.
2. Measured with a 4.7 kΩ load pulled up to Vcc.

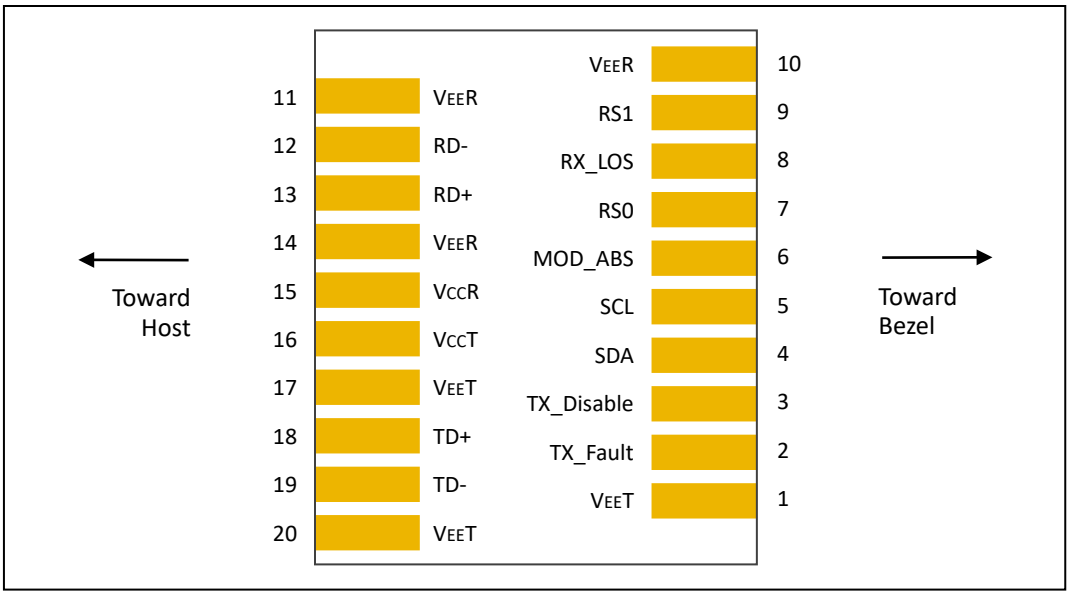
Digital Diagnostics					
Parameter	**Symbol**	**Min**	**Typical**	**Max**	**Unit**
Temperature DDM Accuracy	DMI_Temp	-3		+3	ºC
Supply Voltage DDM Accuracy	DMI_Vcc	-5%		+5%	V
Rx Power DDM Accuracy	DMI_Tx	-3		+3	dB
Tx Power DDM Accuracy	DMI_Rx	-3		+3	dB

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_on			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
Serial ID Clock Rate	f_serial_clock			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 from TX Fault to TX nominal.
6. Time from LOS state to RX LOS assert.
7. Time from non-LOS state to RX LOS de-assert.

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

- MSA SFF-8431
- FC-PI-6
- RoHS

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