



SPP85P301R2D000

MSA Compliant 1/10GBase-SR SFP+ Dual-Rate Transceiver (MMF, 850nm, 300m, LC, DOM, -40 to 85C)

Product Description

This MSA compliant SFP+ transceiver provides 10GBase-SR throughput up to 300m over multi-mode fiber (MMF) using a wavelength of 850nm via an LC connector. It is also capable of withstanding rugged environments and can operate at temperatures between -40 to 85C. It is built to MSA standards and is uniquely serialized and data-traffic and application tested to ensure that they will integrate into your network seamlessly. Digital optical monitoring (DOM) support is also present to allow access to real-time operating parameters. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

Skylane's transceivers are RoHS compliant and lead-free.

Features:

- Supports Rate Selectable 1.25Gbps or 9.83Gbps to 11.3Gbps Bit Rates
- Compliant with SFF-8431
- Compliant with IEEE 802.3-2012 10GBASE-SR/SW and 1000BASE-SX
- 850nm VCSEL Laser Transmitter
- Duplex LC Connector
- Hot-Pluggable SFP+ Footprint
- Class 1 Laser
- Built-In Digital Diagnostic Functions
- RoHS Compliant and Lead-Free
- Operating Temperature: -40 to 85 Celsius



Applications:

- 10GBase-SR Ethernet

For your product safety, please read the following information carefully before any manipulation of the transceiver:



ESD

This transceiver is specified as ESD threshold 1kV for SFI pins and 2kV for all others electrical input pins, tested per MIL-STD-883G, Method 3015.4 /JESD22-A114-A (HBM). However, normal ESD precautions are still required during the handling of this module.



LASER SAFETY

This is a Class1 Laser Product according to IEC 60825-1:2007. This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated (June 24, 2007).

The optical ports of the module need to be terminated with an optical connector or with a dust plug in order to avoid contamination.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Maximum Supply Voltage	Vcc	-0.5		4	V	1
Storage Temperature	Tstg	-40		85	°C	
Operating Case Temperature	Tc	-40		85	°C	
Data Rate (RS0 = Low)	DR		1.25		Gbps	2
Data Rate (RS0 = High)	DR	9.83	10.3125	11.3	Gbps	2
Bit Error Rate	BER			10 ⁻¹²		

Notes:

1. For the electrical power interface.
2. IEEE 802.3-2012.

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Module Supply Voltage	Vcc	3.14	3.3	3.46	V	
Module Supply Current	Icc		180	300	mA	1
Transmitter						
Input Differential Impedance	RIN		100		Ω	
Differential Data Input Swing	VIN,pp	180		700	mVp-p	
Transmit Disable Voltage	VD	2		Host_Vcc	V	
Transmit Enable Voltage	VEN	Vee		Vee+0.8	V	
Receiver						
Differential Data Output Swing	VOUT,pp	300		850	mVp-p	
Data Output Rise/Fall Time (20-80%)	Tr/Tf	28			ps	
LOS Assert	VLOSA	2		Host_Vcc	V	
LOS De-Assert	VLOSD	Vee		Vee+0.5	V	

Notes:

1. For the electrical power interface.

Optical Characteristics RS0 = Low (1G Operation)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Output Optical Power	P _{TX}	-9.5		-1	dBm	1
Optical Center Wavelength	λ _C	840	850	860	nm	
Rise/Fall Time (20-80%)	T _r /T _f			300	ps	
Extinction Ratio	ER	9			dB	
Spectral Width (RMS)	Δλ			0.45	nm	
Relative Intensity Noise	RIN			-120	dB/Hz	
Transmitter Jitter	TJ					2
Launch Power of Off Transmitter	P _{off}			-30	dBm	3
Receiver						
Optical Center Wavelength	λ _C	840		860	nm	
Receiver Sensitivity @1.25Gbps	R _{X_SEN}			-17	dBm	4
Receiver Overload	P _{OL}	0.5			dBm	
Optical Return Loss	ORL	12			dB	
LOS Assert	LOSA	-30			dBm	
LOS De-Assert	LOSD			-18	dBm	
LOS Hysteresis	LOSH	0.5			dB	

Notes:

1. Class 1 Product.
2. According to IEEE 802.3-2012 requirements.
3. Average.
4. Measured with worst ER, BER<10⁻¹², and 2⁷-1 PRBS.

Optical Characteristics RS0 = High (10G Operation)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Output Optical Power	P _{TX}	-5		-1	dBm	1
Optical Center Wavelength	λ_C	840	850	860	nm	
Optical Modulation Amplitude	OMA		-1.5		dBm	2
Extinction Ratio	ER	3	5.5		dB	
Spectral Width (RMS)	$\Delta\lambda$			0.45	nm	
Relative Intensity Noise	RIN			-128	dB/Hz	
Transmitter Dispersion Penalty	TDP			3.9	dB	
Transmitter Jitter	TJ					3
Launch Power of Off Transmitter	P _{off}			-30	dBm	4
Receiver						
Optical Center Wavelength	λ_C	840		860	nm	
Receiver Sensitivity @10.3Gbps	R _{X_SEN}			-10	dBm	1
Receiver Overload	P _{OL}	0.5			dBm	
Receiver Reflectance	TR _{RX}			-12	dB	
LOS Assert	LOSA	-30			dBm	
LOS De-Assert	LOSD			-14	dBm	
LOS Hysteresis	LOSH	0.5			dB	

Notes:

1. Class 1 Product.
2. IEEE 802.3-2012.
3. According to IEEE 802.3-2012 requirements.
4. Average.
5. Measured with worst ER, BER<10⁻¹², and 2³¹-1 PRBS.

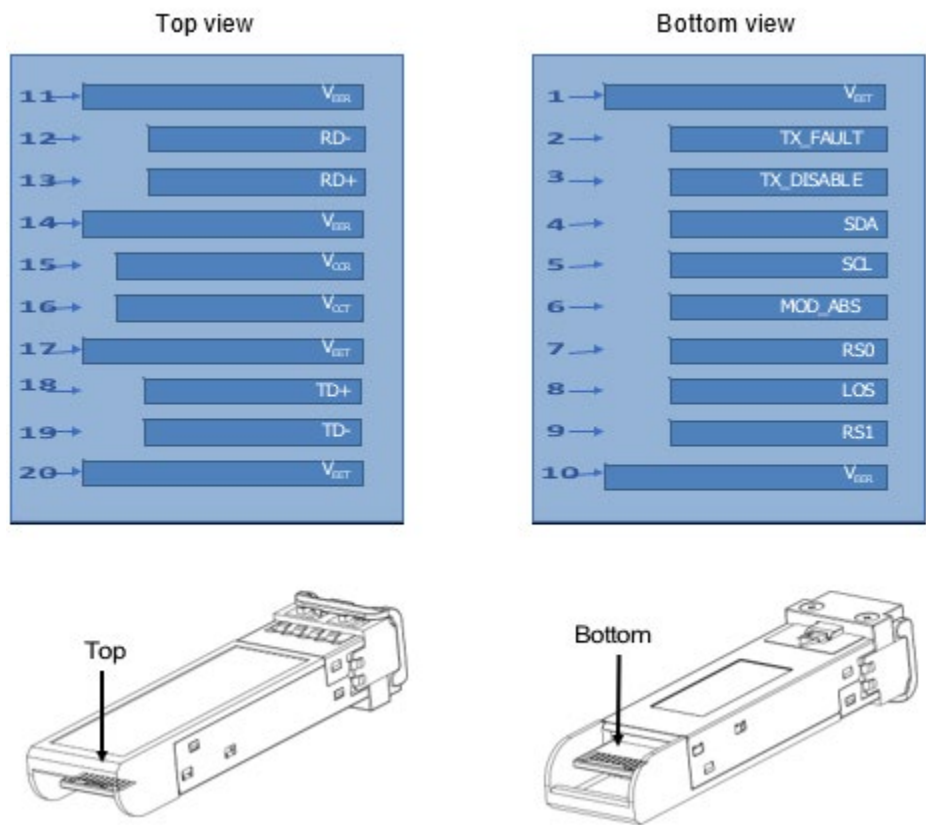
Pin Descriptions

Pin	Symbol	Name/Description	Notes
1	VeeT	Transmitter Ground (Common with Receiver Ground).	1
2	Tx_Fault	Transmitter Fault.	
3	Tx_Disable	Transmitter Disable. Laser output disables on “high” or “open.”	2
4	SDA	2-Wire Serial Interface Data.	3
5	SCL	2-Wire Serial Interface Clock.	3
6	MOD_ABS	Module Absent. Grounded within the module.	3
7	RS0	Rate Selection.	
8	LOS	Loss of Signal Indication. “Logic 0” indicates normal operation.	4
9	RS1	No Connection Required.	1
10	VeeR	Receiver Ground (Common with Transmitter Ground).	1
11	VeeR	Receiver Ground (Common with Transmitter Ground).	1
12	RD-	Inverse Receiver Data Out. AC Coupled.	
13	RD+	Received 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 Data In. AC Coupled.	
19	TD-	Inverse Transmitter Data In. AC Coupled.	
20	VeeT	Transmitter Ground (Common with Receiver Ground).	1

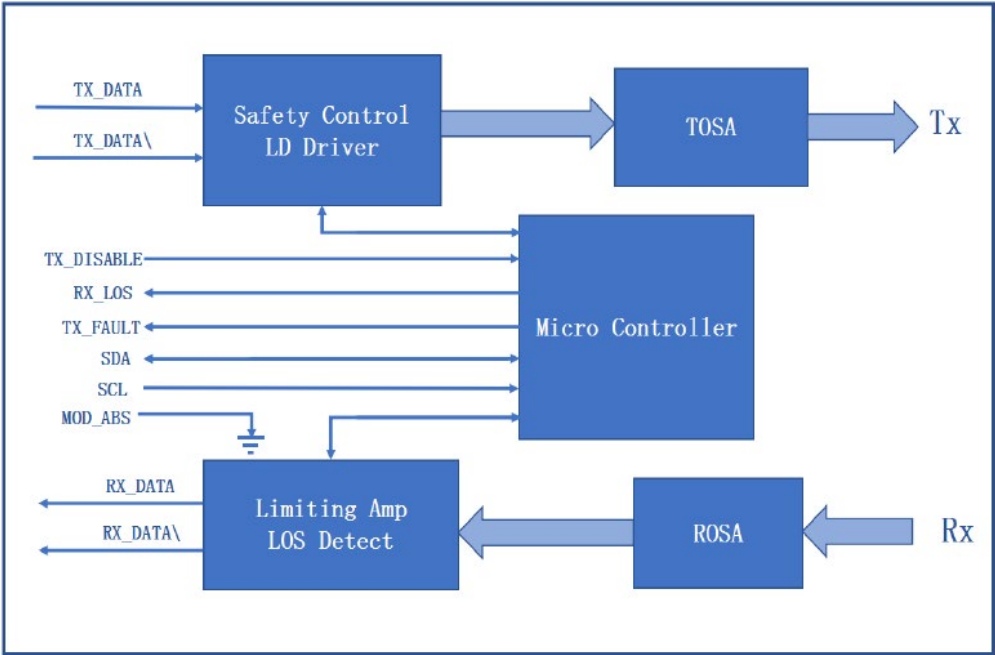
Notes:

1. The circuit ground is isolated from the chassis ground.
2. Disabled: $T_{DIS} > 2V$ or open. Enabled: $T_{DIS} < 0.8V$.
3. Should be pulled up with 4.7k Ω to 10k Ω on the host board to a voltage between 2V and $V_{cc} + 0.3V$.
4. LOS is an open collector output.

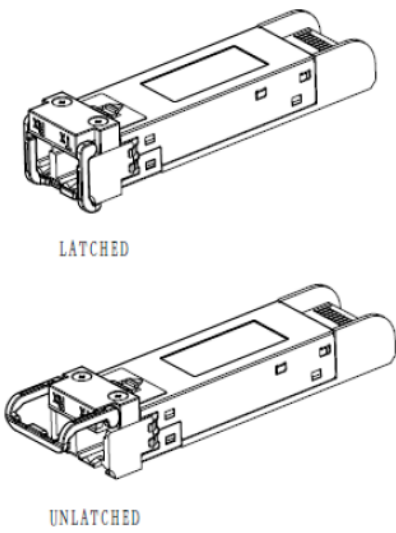
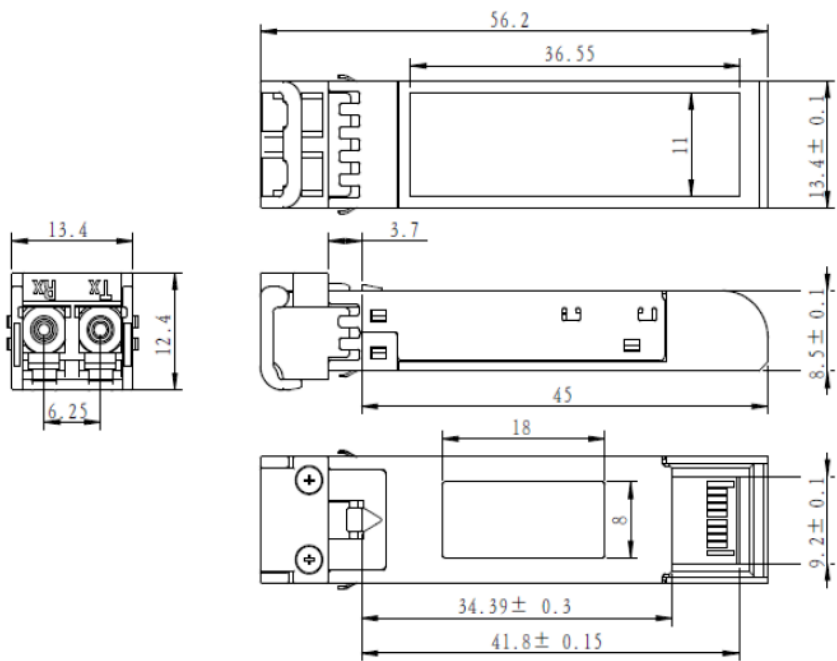
Electrical Pin-Out Details



Block Diagram



Mechanical Specifications



About Skylane Optics

Skylane is a leading provider of transceivers for optical communication.

We offer an extensive portfolio for the enterprise, access, datacenter and metropolitan fiber optical market as well as for smart home applications and home networks.

We cover the European, South American and North American market with a strong partner network and have offices in Belgium, Brazil, Sweden and USA.

Our offerings are characterized by high quality and performance. In combination with our strong technical support, we enable our customers to build cost optimized network solutions.

We offer an extensive range of high-quality products including transceivers (Optical and copper), Active Optical Cable (AOC), Direct Attach Cable (DAC), Mux/Demux, Coding Box.

