SPP13020100B000

MSA Compliant 10GBase-LR SFP+ Transceiver Dual-Rate (SMF, 1310nm, 20km, LC, DOM)

Product Description

This MSA compliant dual-rate SFP+ transceiver provides 10GBase-LR throughput up to 20km over single-mode fiber (SMF) using a wavelength of 1310nm via an LC connector. It can operate at temperatures between 0 and 70C. All of our transceivers are built to comply with Multi-Source Agreement (MSA) standards and are uniquely serialized and tested for data-traffic and application to ensure seamless network integration. Additional product features include Digital Optical Monitoring (DOM) support which allows 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:

- Compliant with IEEE802.3ae 10GBASE-LR/LW
- 1310nm DFB-LD Transmitter
- Compliant with MSA SFP+ Specification SFF-8431
- Single 3.3V Power Supply and TTL Logic Interface
- Duplex LC Connector
- Distance up to 20km
- Hot-Pluggable
- Commercial Temperature 0 to 70 Celsius
- Excellent ESD Protection
- Metal with Lower EMI
- RoHS compliant and Lead Free

Applications:

- 1000Base-LX/10GBASE-LR Ethernet
- Access and Enterprise
- 1x Fibre Channel

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	0		70	°C	
Relative Humidity	RH	0		85	%	
Data Rate	DR	9.83	10.3125	11.3	Gb/s	2
Bit Error Rate	BER			10^{-12}		

Notes:

1. For electrical interface
2. IEEE 802.3ae

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Module Supply Voltage	Vcc	3.14	3.3	3.46	V	
Module Supply Current	Icc		200	310	mA	
Power Dissipation	PD		0.65	1.0	W	
Transmitter						
Input Differential Impedance	R_{IN}		100		Ω	
Differential Data Input Swing	$V_{IN\ PP}$	180		700	mV	
Transmit Disable Voltage	V_D	2		V_{CC}	V	
Transmit Enable Voltage	V_{EN}	V_{EE}		V_{EE}+0.8	V	
Receiver						
Differential Data Output Swing	$V_{OUT\ PP}$	300		850	mV	
Data Output Rise/Fall Time (20%-80%)	t_r/t_f	28			ps	
LOS Assert	$V_{LOS\ A}$	2		$V_{CC\ HOST}$	V	
LOS De-Assert	$V_{LOS\ D}$	V_{EE}		V_{EE}+0.5	V	

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Output Optical Power	P_{TX}	-8.2		0.5	dBm	1
Optical Center Wavelength	λ_C	1260		1355	nm	
Optical Modulation Amplitude	OMA	-5.2			dBm	2
Extinction Ratio	ER	3.5	5.5		dB	
Spectral Width(-20dB)	$\Delta\lambda$			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Relative Intensity Noise	RIN			-128	dB/Hz	
Transmitter Dispersion Penalty	TDP			3.2	dB	
Launch Power of OFF Transmitter	P_{OUT_OFF}			-30	dBm	1
Transmitter Jitter						2
Receiver						
Optical Center Wavelength	λ_C	1260		1600	nm	
Average Receive Power	P_{RX}	-14.4		0.5	dBm	
Receiver Sensitivity @10.3Gb/s	R_{X_SEN}			-14.4	dBm	3
Receiver Reflectance	TR_{RX}			-12	dB	
LOS Assert	LOS_A	-30			dBm	
LOS De-Assert	LOS_D			-17	dBm	
LOS Hysteresis	LOS_H	0.5			dB	

Notes:

1. Average
2. According to IEEE 802.3ae requirement.
3. Test the resulting value using the minimum ER value within the defined range; BER<10^{-12}; 2^{31}-1 PRBS.

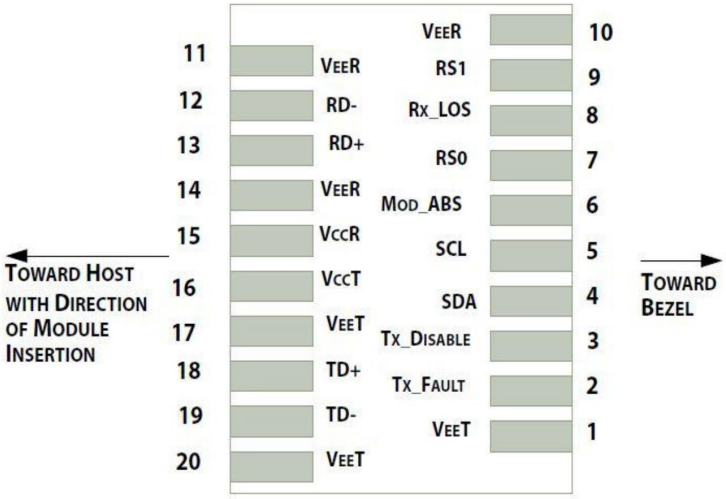
Pin Descriptions

Pin	Symbol	Name/Descriptions	Ref.
1	VeeT	Transmitter Ground.	1
2	Tx_Fault	Transmitter Fault. LVTTL-O. “High” indicates a fault condition.	2
3	Tx_Disable	Transmitter Disable. LVTTL-I. “High” or “open” disables the transmitter.	3
4	SDA	2-Wire Serial Interface Data. LVCMOS-I/O. MOD-DEF2.	4
5	SCL	2-Wire Serial Interface Clock. LVCMOS-I/O. MOD-DEF1.	4
6	MOD_ABS	Module Absent (Output). Connected to VeeT or VeeR in the module.	5
7	RS0	N/A.	6
8	Rx_LOS	Receiver Loss of Signal. LVTTL-O.	2
9	RS1	N/A.	6
10	VeeR	Receiver Ground.	1
11	VeeR	Receiver Ground.	1
12	RD-	Inverse Received Data Out. CML-O.	
13	RD+	Received Data Out. CML-O.	
14	VeeR	Receiver Ground.	
15	VccR	+3.3V Receiver Power.	
16	VccT	+3.3V Transmitter Power.	
17	VeeT	Transmitter Ground.	1
18	TD+	Transmitter Data In. CML-I.	
19	TD-	Inverse Transmitter Data In. CML-I.	
20	VeeT	Transmitter Ground.	1

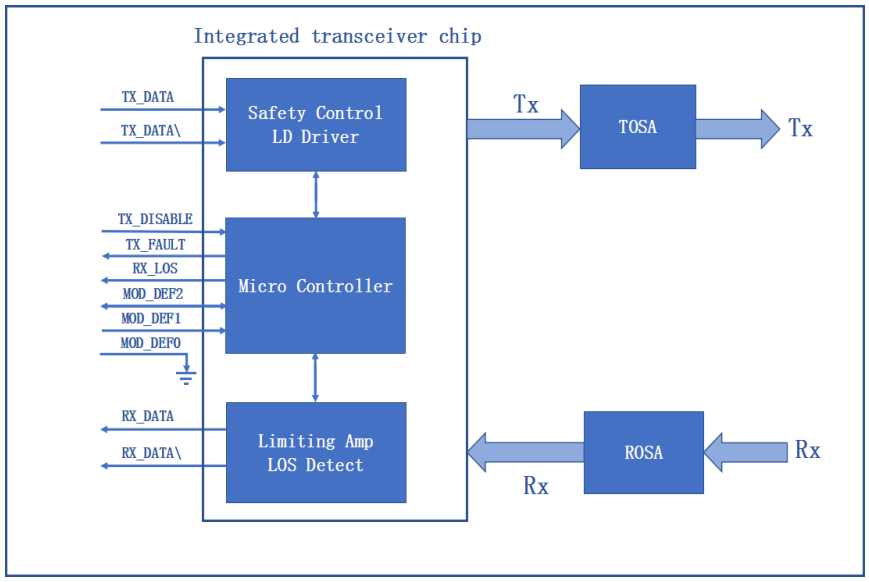
Notes:

1. The module signal grounds are isolated from the module case.
2. This is an open collector/drain output that on the host board requires a 4.7KΩ to 10KΩ pull-up resistor to Host_Vcc.
3. This input is internally biased high with a 4.7KΩ to 10KΩ pull-up resistor to VccT.
4. 2-Wire Serial Interface Clock and Data lines require an external pull-up resistor dependent on the capacitance load.
5. This is a ground return that, on the host board, requires a 4.7KΩ to 10KΩ pull-up resistor to the Host_Vcc.
6. Rate select can also be set through the 2-wire bus in accordance with SFF-8472 v. 12.1. Rx Rate Select is set at Bit 3, Byte 110, and Address A2h, and Tx Rate Select is set at Bit 3, Byte 118, and Address A2h. **Note:** Writing a “1” selects maximum bandwidth operation. Rate select is the logic OR of the input state of Rate Select Pin and 2-wire bus.

Electrical Pin-out Details



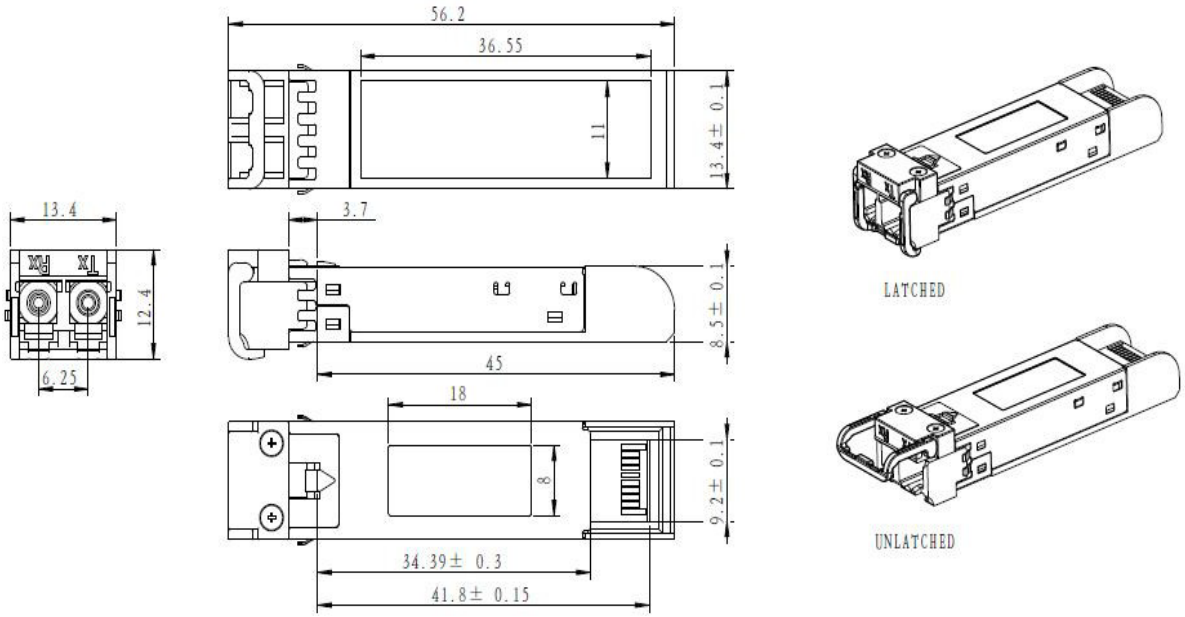
Block Diagram



Mechanical Specifications

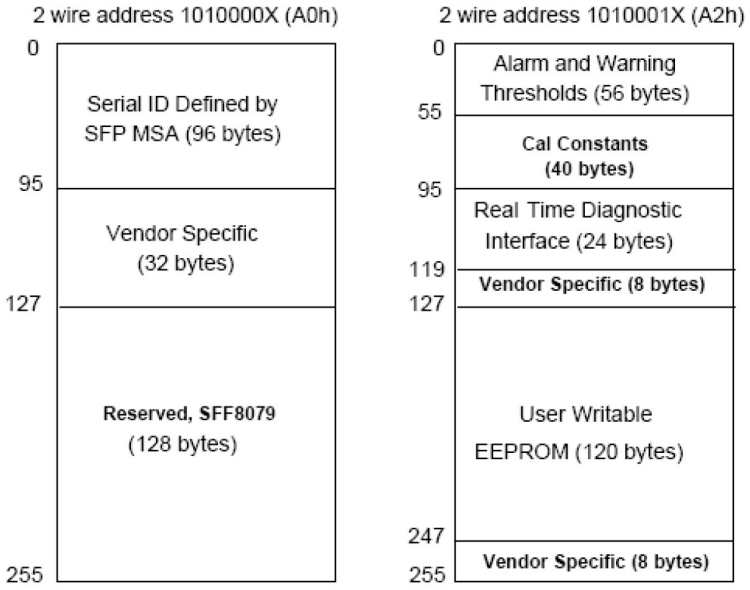
ALL DIMENSIONS ARE ±0.2mm UNLESS OTHERWISE SPECIFIED

UNIT: mm



EEPROM Information

EEPROM memory map-specific data field description is as below:



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.