



SPDT9040102D000

MSA 10GBase-DWDM SFP+ Transceiver 100GHz (SMF, 1544.53nm to 1537.40nm, 40km, LC, DOM, -40 to 85C)

Product Description

This Industry Standard SFP+ transceiver provides 10GBase-DWDM throughput up to 40km over single-mode fiber (SMF) using a wavelength of 1544.53nm to 1537.40nm via an LC connector. It is guaranteed to be 100% compatible with the equivalent Industry Standard transceiver. This easy to install, hot swappable transceiver has been programmed, uniquely serialized and data-traffic and application tested to ensure that it will initialize and perform identically. 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 9.95 to 11.3Gbps or 1.25Gbps Bit Rates Automatically Adaptive (With CDR)
- 100GHz ITU-Based Channel Spacing (C-Band)
- Up to 40km Link Length @9.95 to 11.3Gbps or Up to 80km Link Length @1.25Gbps
- APD Receiver with Limiting Amplifier
- Duplex LC Connector
- Monolithic EML Tunable TOSA
- Positive Power Supply Lines: 3.3V
- Low Power Consumption: 2.7w
- RoHS Compliant and Lead-Free
- Operating Temperature: -40 to 85 Celsius



Applications:

- 10x Gigabit Ethernet over DWDM
- Access, Metro and Enterprise
- Gigabit Ethernet over CWDM

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.

ITU Channel Wavelength Guide

ITU Channel	Frequency (THz)	Center Wavelength (nm)	ITU Channel	Frequency (THz)	Center Wavelength (nm)
11	191.1	1568.11	36	193.6	1548.51
12	191.2	1567.95	37	193.7	1547.72
13	191.3	1567.13	38	193.8	1546.92
14	191.4	1566.31	39	193.9	1546.12
15	191.5	1565.50	40	194.0	1545.32
16	191.6	1564.68	41	194.1	1544.53
17	191.7	1563.86	42	194.2	1543.73
18	191.8	1563.05	43	194.3	1542.94
19	191.9	1562.23	44	194.4	1542.14
20	192.0	1561.42	45	194.5	1541.35
21	192.1	1560.61	46	194.6	1540.56
22	192.2	1559.79	47	194.7	1539.77
23	192.3	1558.98	48	194.8	1538.98
24	192.4	1558.17	49	194.9	1538.19
25	192.5	1557.36	50	195.0	1537.4
26	192.6	1556.55	51	195.1	1536.61
27	192.7	1555.75	52	195.2	1535.82
28	192.8	1554.94	53	195.3	1535.04
29	192.9	1554.13	54	195.4	1534.25
30	193.0	1553.33	55	195.5	1533.47
31	193.1	1552.52	56	195.6	1532.68
32	193.2	1551.72	57	195.7	1531.9
33	193.3	1550.92	58	195.8	1531.12
34	193.4	1550.12	59	195.9	1530.33
35	193.5	1549.32	60	196.0	1529.55

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Maximum Supply Voltage	Vcc	0		3.6	V	
Storage Temperature	Tstg	-40		85	°C	
Operating Case Temperature	Tc	-40		85	°C	
Operating Relative Humidity	RH	5		85	%	
Storage Relative Humidity	RH	5		95	%	
Power Consumption				2.7	W	

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	Vcc	3.135	3.3	3.465	V	
Transmitter						
Differential Data Input Swing	VIN	170		700	mV	
Input Differential Impedance	ZIN		100		Ω	
Transmitter Disable Voltage	VDIS	2.0		Vcc	V	
Transmitter Enable Voltage	VEN	0		0.8	V	
Receiver						
Differential Data Output Swing	VOUT	300		850	mV	
Output Differential Impedance	ZOUT		100		Ω	
LOS Assert Voltage	VLOSA	2.0		Vcc	V	
LOS De-Assert Voltage	VLOSD	0		0.8	V	

Timing Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Module Initialize Time	Tinit			20	s	
Module Channel Switch Time	Tsel			200	ms	

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter (10G & 1.25G)						
Average Output Power	PAVE	-2		3	dBm	1
Optical Wavelength	λ	As Per ITU-T 694.1, 100GHz Spacing			nm	2
Center Frequency Spacing	$\Delta\nu$	100			GHz	
Center Frequency Stability	-	-12.5		+12.5	GHz	
Side Mode Suppression Ratio	SMSR	30			dB	
Average Output Power (Laser Off)	Poff			-30	dBm	
Extinction Ratio	ER	8.2			dB	3
Dispersion Penalty	DP			2	dB	
Relative Intensity Noise	RIN			-128	dB/Hz	
Optical Return Loss Tolerance	ORLT	21			dB	
Receiver (10G)						
Optical Center Wavelength		1260		1600	nm	
Received Sensitivity	RSENS			-23	dBm	4
Optical Power Overload	POL			-7	dBm	
Receiver Reflectance	RFL			-27	dB	
Rx_LOS of Signal Assert	LOSA	-40			dBm	
Rx_LOS of Signal De-Assert	LOSD			-25	dBm	
Rx_LOS of Signal Hysteresis	LOSH	0.5		6	dB	
Receiver (1.25G)						
Optical Center Wavelength		1260		1600	nm	
Received Sensitivity	RSENS			-28	dBm	5
Optical Power Overload	POL			-7	dBm	
Receiver Reflectance	RFL			-27	dB	
Rx_LOS of Signal Assert	LOSA	-40			dBm	
Rx_LOS of Signal De-Assert	LOSD			-30	dBm	
Rx_LOS of Signal Hysteresis	LOSH	0.5		6	dB	

Notes:

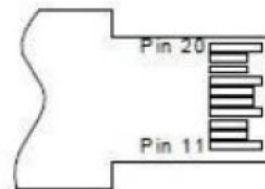
1. The optical power is launched into SMF.
2. See details in ITU Channel Wavelength Guide.
3. Measured with PRBS 2³¹-1 test pattern @10.3125Gbps or 2⁷-1 test pattern @1.25Gbps.
4. Measured with worst ER=8.2dB, BER less than 1E⁻¹², and PRBS 2³¹-1 @10.3125Gbps.
5. Measured with worst ER=8.2dB, BER less than 1E⁻¹², and PRBS 2⁷-1 @1.25Gbps.

Pin Descriptions

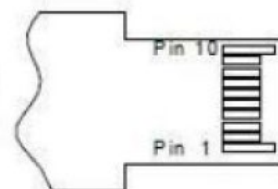
Pin	Symbol	Name/Description	Notes
1	VeeT	Transmitter Ground. Common with Receiver Ground.	
2	Tx_Fault	Transmitter Fault.	
3	Tx_Disable	Transmitter Disable. Laser output disabled on “high” or “open.”	
4	SDA	2-Wire Serial Interface Data.	
5	SCL	2-Wire Serial Interface Clock.	
6	MOD_ABS	Module Absent. Grounded within the Module.	
7	RS0	Rate Select 0.	
8	LOS	Loss of Signal Indication. “Logic 0” indicates normal operation.	
9	RS1	No Connection Required.	
10	VeeR	Receiver Ground. Common with Transmitter Ground.	
11	VeeR	Receiver Ground. Common with Transmitter Ground.	
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.	
15	VccR	Receiver Power Supply.	
16	VccT	Transmitter Power Supply.	
17	VeeT	Transmitter Ground. Common with Receiver Ground.	
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.	

Electrical Pin-Out Details

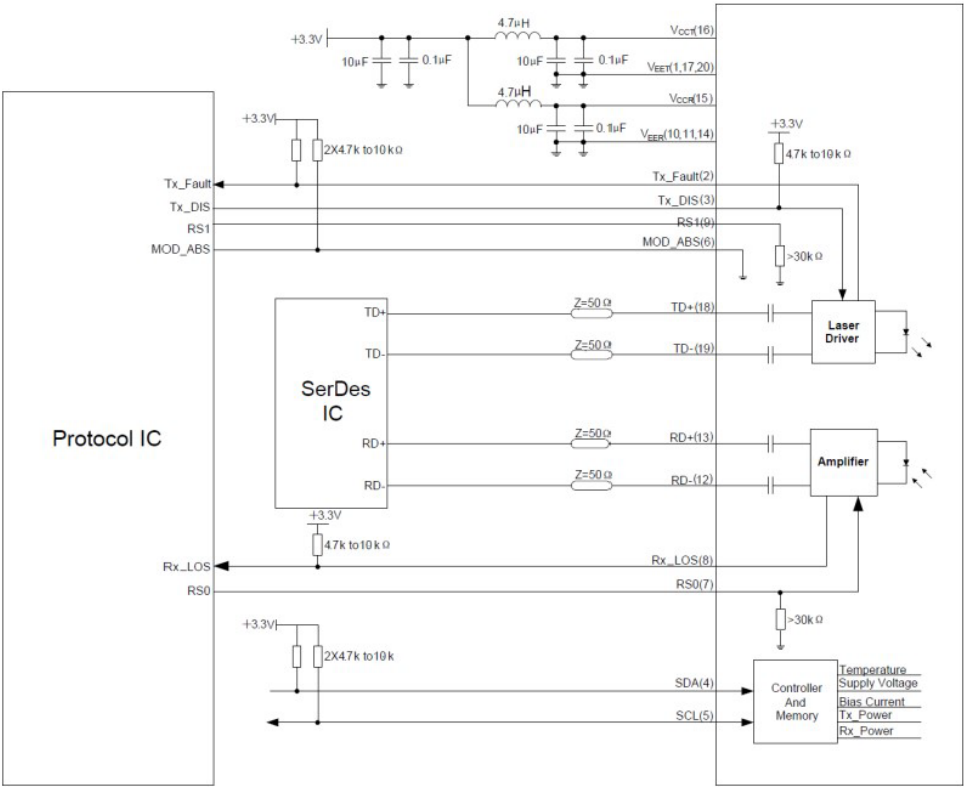
TOP VIEW
OF BOARD



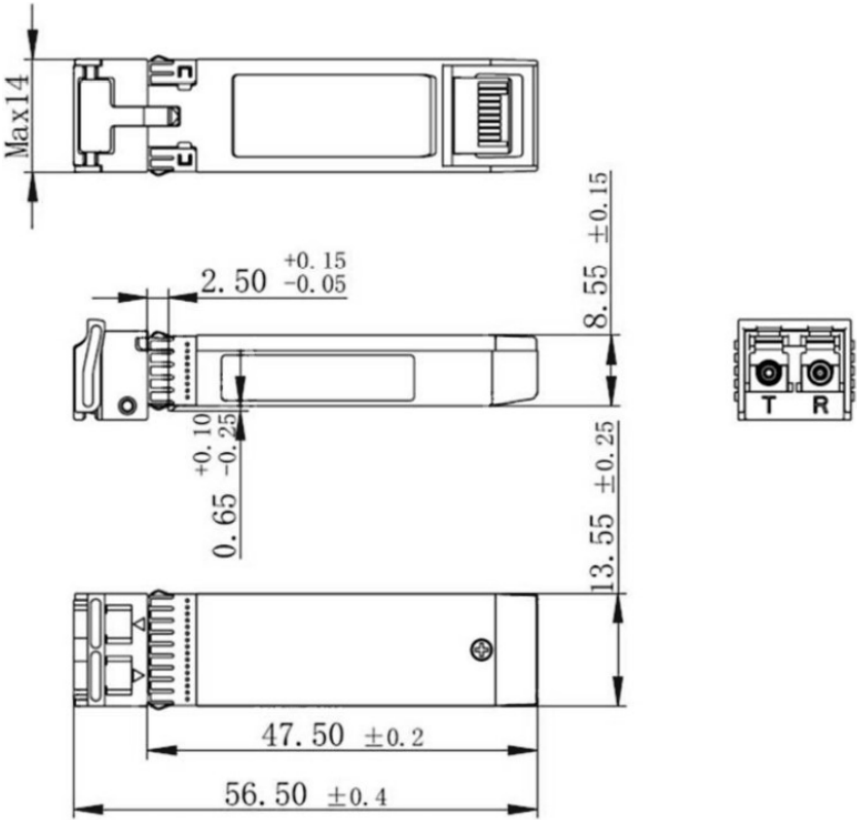
BOTTOM VIEW
OF BOARD



Recommended Interface Circuit



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.

