



SFP56-50GBASE-LR-C-SKY

Cisco® Compatible 50GBase-LR SFP56 Transceiver (SMF, 1310nm, 10km, LC, DOM)

Product Description

This Cisco® compatible SFP56 transceiver provides 50GBase-LR throughput up to 10km over single-mode fiber (SMF) using a wavelength of 1310nm via an LC connector. Our transceiver is built to meet or exceed OEM specifications and is guaranteed to be 100% compatible with Cisco®. It has been programmed, uniquely serialized, and tested for data-traffic and application to ensure that it will initialize and perform identically. All of our transceivers comply with Multi-Source Agreement (MSA) standards to provide 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:

- SFF-8431 and SFF-8472 Compliance
- Up to 53Gb/s bi-directional data links
- SFP56 package with duplex LC connector
- Cooled 1310 EML Transmitter
- PIN Receiver
- Single-mode Fiber
- Single +3.3V power supply
- Build-in DSP
- 2.5W maximum power consumption
- Class 1 laser safety certified
- Operating Temperature: 0C to 70C
- RoHS Compliant



Applications:

- 50GBase Ethernet
- Access and Enterprise

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.

Regulatory Compliance

- ESD to the Electrical PINs: compatible with MIL-STD-883E Method 3015.4
- ESD to the LC Receptacle: compatible with IEC 61000-4-3
- EMI/EMC compatible with FCC Part 15 Subpart B Rules, EN55022:2010
- Laser Eye Safety compatible with FDA 21CFR, EN60950-1& EN (IEC) 60825-1,2
- RoHS compliant with EU RoHS 2.0 directive 2015/863/EU

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit
Maximum Supply Voltage	Vcc	-0.5		4.0	V
Storage Temperature	TS	-40		85	°C
Operating Case Temperature	Tc	0	25	70	°C
Relative Humidity	RH	5		95	%
Data Rate		10.3125		53.125	Gbps

Electrical Characteristics (TOP=25°C, Vcc=3.3Volts)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage		Vcc	3.135	3.3	3.465	V	
Module Supply Current		Icc			760	mA	
Power Dissipation		P _D			2500	mW	
Transmitter							
Differential data input swing		V _{in} , p-p			900	mVp-p	
Input differential impedance		Z _{in}	90	100	110	Ω	
TX_FAULT	Transmitter Fault	V _{OH}	2.0		V _{CCHOST}	V	
	Normal Operation	V _{OL}	0		0.8	V	
TX_DISABLE	Transmitter Disable	V _{IH}	2.0		V _{CCHOST}	V	
	Transmitter Enable	V _{IL}	0		0.8	V	
Receiver							
Differential data output swing		V _{out} , p-p			900	mVp-p	1
Output differential impedance		Z _o	90	100	110	Ω	
Data Output Rise Time, Fall Time		t _r , t _f	9.5			ps	2
RX_LOS	Loss of signal (LOS)	V _{OH}	2.0		V _{CCHOST}	V	3
	Normal Operation	V _{OL}	0		0.8	V	3

Notes:

1. Internally AC coupled, but requires an external 100Ω differential load termination.

2. 20 – 80 %.
3. LOS is an open collector output. Should be pulled up with 4.7kΩ on the host board.

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Launch Optical Power (average@50G PAM4)	P _{av}	-4.5		+4.2	dBm	1
Launch Optical Power (OMA@50G PAM4)	P _o	-1.5		+4	dBm	1
Launch Optical Power (average@10G&25G NRZ)	P _{av}	-5		+2	dBm	1
Launch Optical Power (OMA@10G&25G NRZ)	P _o	-4		+2.2	dBm	1
TDECQ (50G PAM4)	TDECQ			3.2	dB	
Extinction Ratio	ER	3.5			dB	
Center Wavelength Range	λ _c	1304.5		1317.5	nm	
Spectral Width	Δλ			1	nm	2
Side Mode suppression Ratio	SMSR	35			dB	
Optical Return Loss Tolerance	ORLT			15.1	dB	
Pout @TX-Disable Asserted	P _{off}			-30	dBm	
Receiver						
50G Receiver Sensitivity (average)	R _{av}			-10.8	dBm	3
50G Receiver Sensitivity (OMA)	R _{oma}			-7.7	dBm	3
25G Receiver Sensitivity (average)	R _{av}			-12	dBm	4
25G Receiver Sensitivity (OMA)	R _{oma}			-11.3	dBm	4
10G Receiver Sensitivity (average)	R _{av}			-12	dBm	5
10G Receiver Sensitivity (OMA)	R _{oma}			-11.3	dBm	5
Receiver Overload	P _{av}	+4.2			dBm	
Optical Wavelength Range	λ _c	1260		1340	nm	
Receiver Reflectance				-26	dB	
LOS De-Assert	LOS _D			-12	dBm	
LOS Assert	LOS _A	-20			dBm	
LOS Hysteresis		0.5			dB	

Notes:

1. Class 1 Laser Safety per FDA/CDRH and EN (IEC) 60825 regulations.
2. 20dB spectral width.
3. Measured with PRBS 2³¹-1 at 2.4×10⁻⁴ BER.
4. Measured with PRBS 2³¹-1 at 5×10⁻⁵ BER.

5. Measured with PRBS $2^{31}-1$ at 1×10^{-12} BER.

Multi-rate Functionality

Through the I2C interface, the data rate ranges can be set through byte 110 & byte 118 (in the 0xA2)

Bit 110.3 soft RS0	Bit 118.3 soft RS1	Data Rate
0	0	10.31Gbps
0	1	NA
1	0	25.78Gbps
1	1	53.12Gbps (default setting)

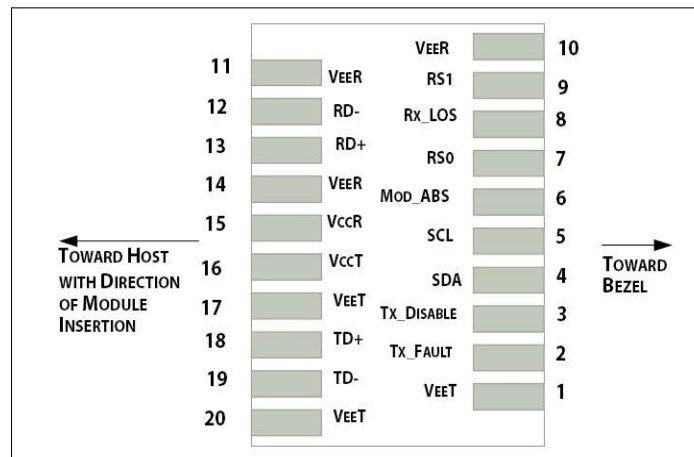
Note: Rate selection only supports software function but not hardware pin function

Pin Descriptions

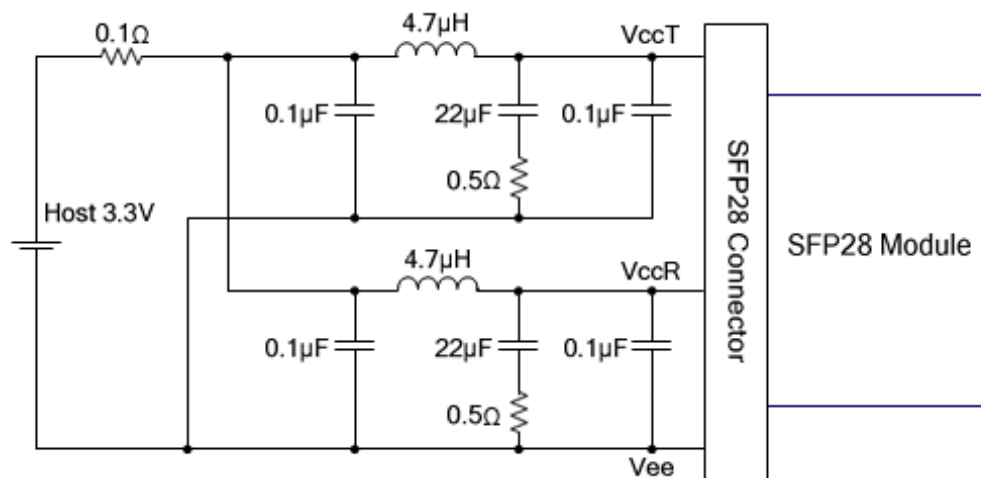
Pin	Symbol	Name/Descriptions	Notes
1	VeeT	Transmitter Ground	1
2	TX_Fault	Transmitter Fault (LVTTL-O) - High indicates a fault condition	2
3	TX_Disable	Transmitter Disable (LVTTL-I) – High or open disables the transmitter	3
4	SDA	Two wire serial interface Data Line (LVCMOS-I/O) (MOD-DEF2)	4
5	SCL	Two wire serial interface Clock Line (LVCMOS-I/O) (MOD-DEF1)	4
6	MOD_ABS	Module Absent (Output), connected to VeeT or VeeR in the module	5
7	RS0	NA	6
8	RX_LOS	Receiver Loss of Signal (LVTTL-O)	2
9	RS1	NA	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	Receiver Power - +3.3V	
16	VccT	Transmitter Power - +3.3 V	
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:

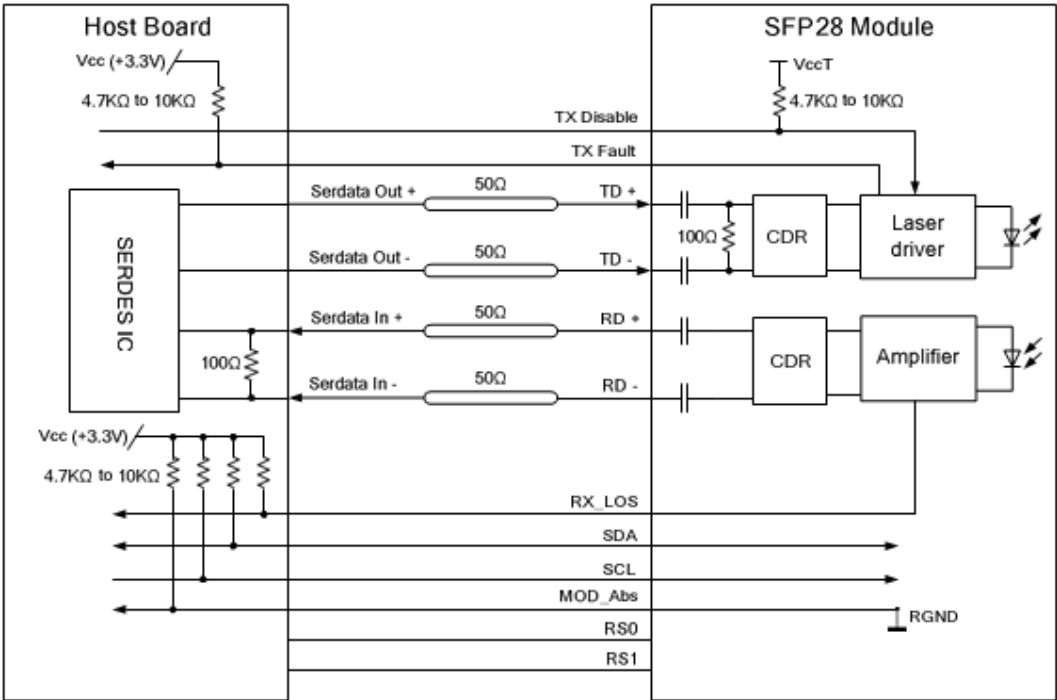
1. The module signal grounds are isolated from the module case.
2. This is an open collector/drain output that on the host board requires a 4.7K Ω to 10K Ω pull-up resistor to Vcc-Host.
3. This input is internally biased high with a 4.7K Ω to 10K Ω pull-up resistor to VccT.
4. Two-Wire Serial interface clock and data lines require an external pull-up resistor.
5. This is a ground return that on the host board requires a 4.7K Ω to 10K Ω pull-up resistor to Vcc-Host.
6. Rate select not available



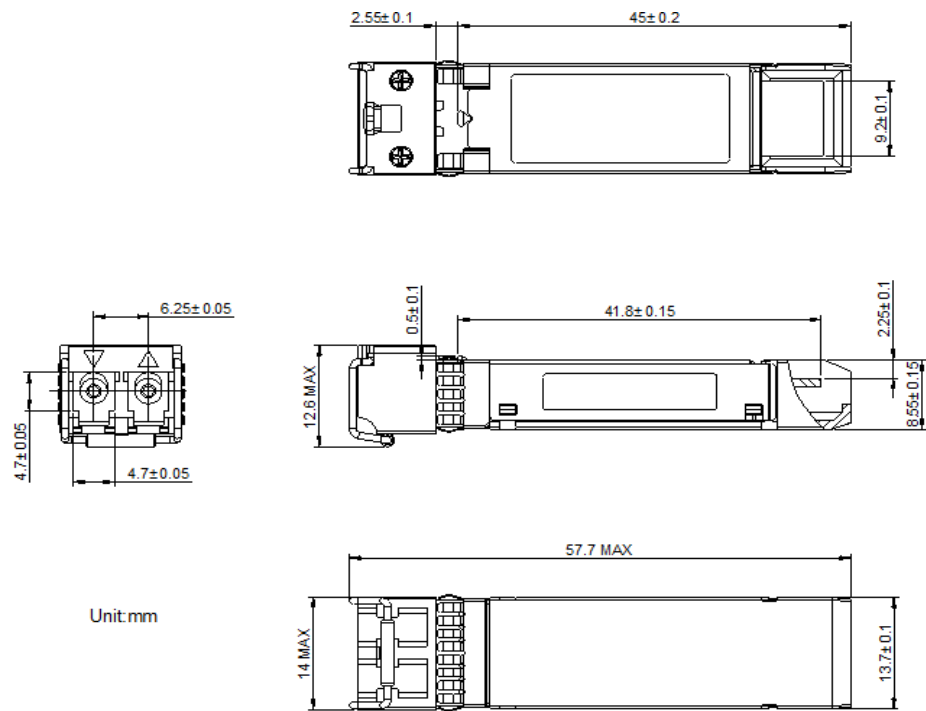
Host PCB SFP28 Pad Assignment Top View

Recommended Host Board Power Supply Filter Network

Recommended Application Interface 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.

