

Features:

- Support CPRI wireless and 25GBASE-LR application
- Support multi-rate for both 10Gps and 25Gbps
- Up to 2km transmission on SMF
- 1310nm DFB laser and PIN receiver
- SFI high speed electrical interface
- 2-wire interface with integrated Digital Diagnostic monitoring
- SFP+ MSA package with duplex LC connector
- Single +3.3V power supply
- Power consumption lower than 1.2W
- Operating case temperature:
Commercial Temp: 0~70°C
Industry Temp: -40~+85°C



Regulatory Compliance

Table 1 – Regulatory Compliance

Feature	Standard	Performance
Electrostatic Discharge (ESD) to the Electrical Pins	MIL-STD-883E Method 3015.7	Class 1(>1000V for SFI pins, >2000V for other pins.)
Electrostatic Discharge (ESD) to the Duplex LC Receptacle	IEC 61000-4-2 GR-1089-CORE	Compatible with standards
Electromagnetic Interference (EMI)	FCC Part 15 Class B EN55022 Class B (CISPR 22B)	Compatible with standards
Immunity	IEC 61000-4-3	Compatible with standards
Laser Eye Safety	FDA 21CFR 1040.10 and 1040.11 EN60950, EN (IEC) 60825-1,2	Compatible with Class I laser product.
RoHS	2011/65/EU	Compliant with standards

Absolute Maximum Ratings

Table 2 – Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Storage Temperature	TS	0		70	°C	1
		-40	-	+85		2
Operating Relative Humidity	RH	5	-	+85	%	

Notes:

1. Commercial Temp

2. Industry Temp

Recommended Operating Conditions

Table 3 – Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Operating Case Temperature	T _{OPR}	0		70	°C	1
		-40	-	85		2
Power Supply Voltage	V _{CC}	3.135	3.3	3.465	V	
Power Supply Current	I _{CC}	-	-	363	mA	3
Power Dissipation	P	-	-	1.2	W	
Bit Rate	BR1	9.8304	10.3125	-	Gbps	4
	BR2	24.33	25.78125	-	Gbps	5
Transmission Distance	TD	-	-	2	km	

Note:

1. Commercial Temp
2. Industry Temp
3. Max. current at 3.3V;
4. With CDR bypass mode;
5. With CDR enable, default.

Optical and Electrical Characteristics

Table 4 – Transmitter Optical Specifications

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Center Wavelength Range	λ_c	1260		1360	nm	
Average Output Power	P _{OUT}	-7	-	2	dBm	1
Optical power OMA	OMA	-4	-	2.2	dBm	
Average Output Power (Laser Off)	P _{OUT-OFF}	-	-	-30	dBm	1
Extinction Ratio	ER	3	-	-	dB	2
Transmitter and Dispersion Penalty	TDP	-	-	2.7	dB	
Transmitter eye mask definition {X1, X2, X3, Y1, Y2, Y3} Hit ratio 5 x 10 ⁻⁵ hits per sample.	-	0.35, 0.44, 0.47, 0.35, 0.35, 0.56				2
RIN _{20OMA}	-	-	-	-130	dB/Hz	
Optical return loss tolerance	-	-	-	20	dB	
Transmitter reflectance	-	-	-	-26	dB	

Note:

1. The optical power is launched into SMF.
2. Measured with a PRBS 2³¹-1 test pattern @25.78125Gbps.

Table 5 – Receiver Optical Specifications

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Center Wavelength Range	λ_c	1260	-	1360	nm	
Receiver sensitivity (OMA)	-	-	-	-9	dBm	1
Receiver Overload	P_{IN-OL}	2	-	-	dBm	1
Damage threshold	-	3	-	-	dBm	1
LOS Assert	LOS_A	-30	-		dBm	
LOS De-assert	LOS_D	-	-	-15	dBm	
LOS Hysteresis	LOS_H	0.5	-	-	dB	
Receiver reflectance	-	-	-	-26	dB	

Note:

1. Measured with a PRBS $2^{31}-1$ test pattern @25.78125Gbps, BER $\leq 5 \times 10^{-5}$.

Table 6 – Electrical Specifications

Transmitter (Module Input)							
Parameter	Symbol	Min.	Typical	Max.	Unit	Notes	
Differential Data Input Amplitude	$V_{IN,P-P}$	180	-	900	mVpp		
Input Differential Impedance	Z_{IN}	90	100	110	Ω		
Tx_Fault	Normal Operation	V_{OL}	-0.3	-	0.4	V	
	Transmitter Fault	V_{OH}	2.4	-	V_{CC}	V	
Tx_Disable	Normal Operation	V_{IL}	-0.3	-	0.8	V	
	Laser Disable	V_{IH}	2.0	-	$V_{CC}+0.3$	V	
Receiver (Module Output)							
Differential Data Output Amplitude	$V_{OUT,P-P}$	300	-	1000	mVpp		
Output Differential Impedance	Z_O	90	100	110	Ω		
Rx_LOS	Normal Operation	V_{OL}	-0.3	-	0.4	V	
	Lose Signal	V_{OH}	2.4	-	V_{CC}	V	

Recommended Host Board Power Supply Circuit

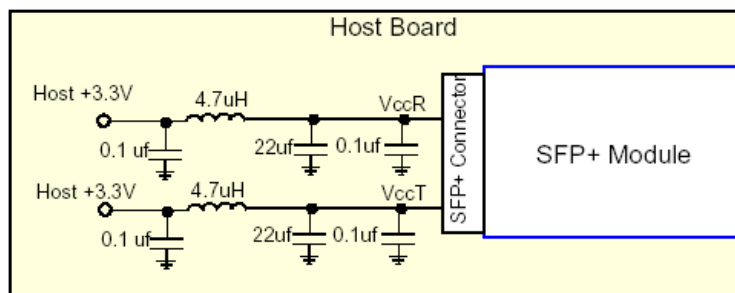


Figure 1, Recommended Host Board Power Supply Circuit

Recommended Interface Circuit

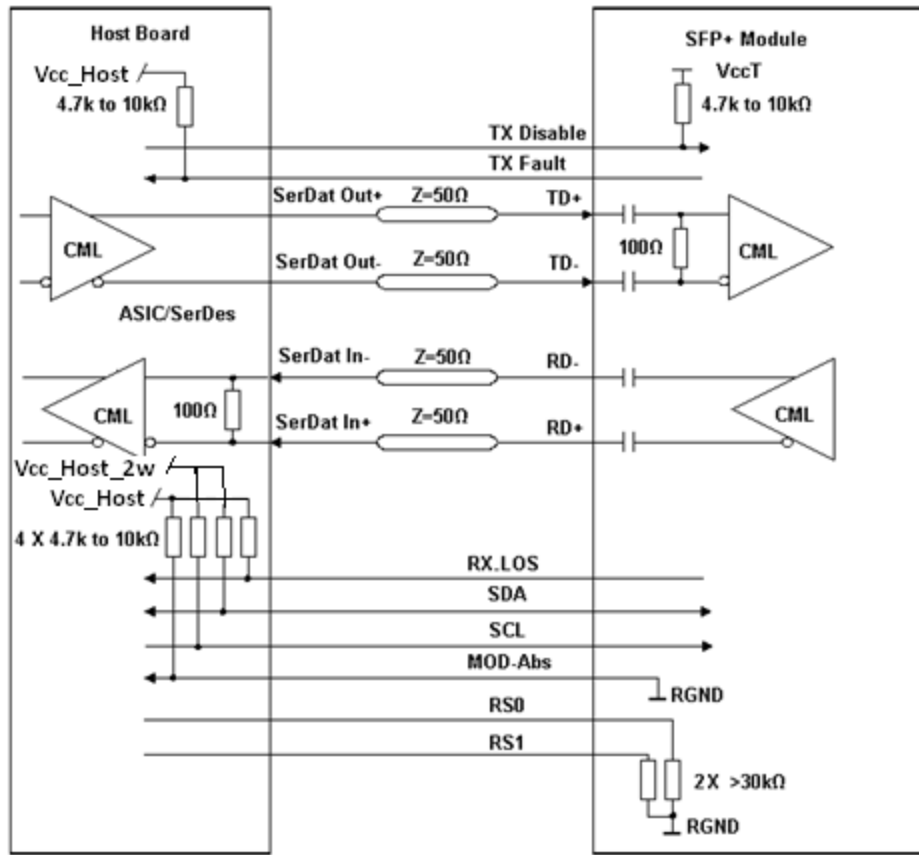


Figure 2, Recommended Interface Circuit

Pin Definitions

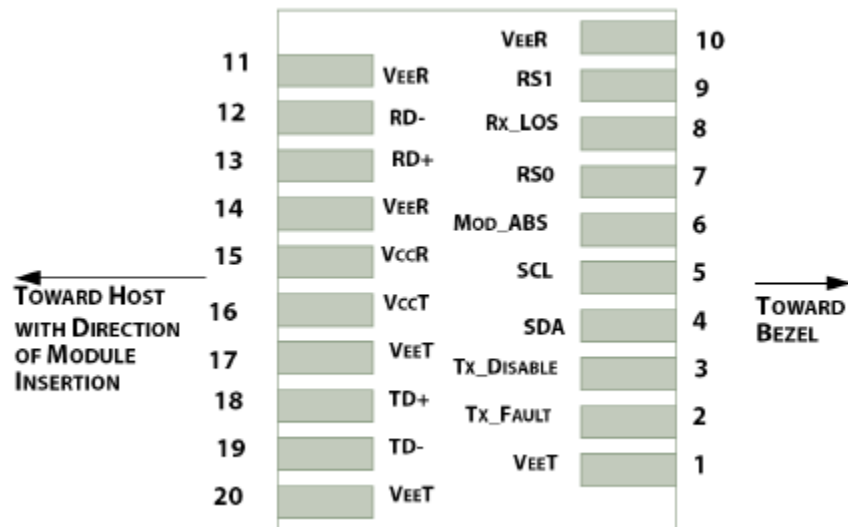


Figure 3, Pin View

Table 7 – Pin Definitions

Contacts	Logic	Symbol	Description	Notes
case		case	Module case	2
1		V _{EE} T	Module Transmitter Ground	3
2	LVTTL-O	TX_FAULT	Module Transmitter Fault	4
3	LVTTL-I	TX_DISABLE	Transmitter Disable; Turns off transmitter laser output	5
4	LVTTL-I/O	SDA	2-wire Serial Interface Data Line(Same as MOD-DEF2 in INF-8074i)	6
5	LVTTL-I/O	SCL	2-wire Serial Interface Clock (Same as MOD-DEF1 in INF-8074i)	6
6		MOD_ABS	Module Absent, connected to V _{EE} T or V _{EE} R in the module	7
7	LVTTL-I	RS0	Rate Select 0, optionally controls SFP+ module receiver.	8
8	LVTTL-O	RX_LOS	Receiver Loss of Signal Indication(In FC designated as Rx_LOS and in Ethernet designated as Signal Detect)	4
9	LVTTL-I	RS1	Rate Select 1, optionally controls SFP+ module transmitter	8
10		V _{EE} R	Module Receiver Ground	3
11		V _{EE} R	Module Receiver Ground	3
12	CML-O	RD-	Receiver Inverted Data Output	
13	CML-O	RD+	Receiver Non-Inverted Data Output	
14		V _{EE} R	Module Receiver Ground	3
15		V _{CC} R	Module Receiver 3.3 V Supply	
16		V _{CC} T	Module Transmitter 3.3 V Supply	
17		V _{EE} T	Module Transmitter Ground	3
18	CML-I	TD+	Transmitter Non-Inverted Data Input	
19	CML-I	TD-	Transmitter Inverted Data Input	
20		V _{EE} T	Module Transmitter Ground	3

Notes:

1. Labeling as inputs (I) and outputs (O) are from the perspective of the module.
2. The case makes electrical contact to the cage before any of the board edge contacts are made.
3. The module signal ground contacts, V_{EE}R and V_{EE}T, should be isolated from the module case.
4. This contact is an open collector/drain output contact and shall be pulled up on the host. Pull ups can be connected to one of several power supplies, however the host board design shall ensure that no module contact has voltage exceeding module V_{CC}T/R + 0.5 V.
5. Tx_Disable is an input contact with a 4.7 kOhms to 10 kOhms pullup to V_{CC}T inside the module.
6. 2-wire interface.
7. The pins shall be pulled up with 4.7K-10Kohms to a voltage between 3.14V and 3.46V on host board.
8. The pins are pulled low to V_{EE}T with a >30kΩ resistor in the module.

Mechanics Drawing

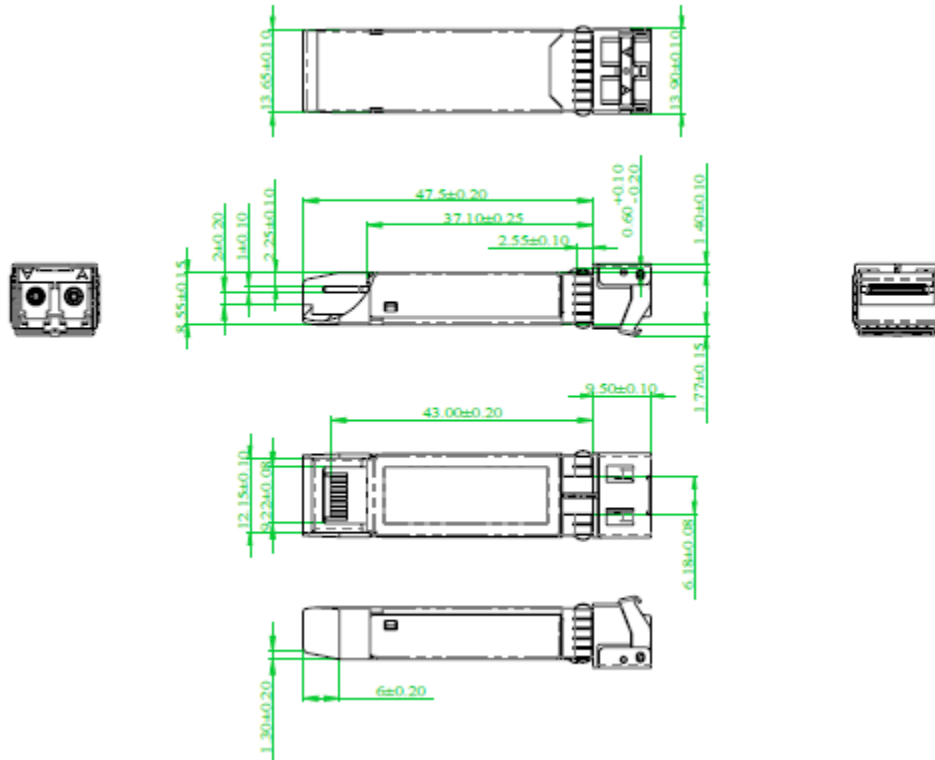


Figure 4 Mechanics drawing

Order Information

Table 8 – Order Information

Part No.	Application	Data Rate	Laser Source	Fiber Type
SP-25E-LR-CDFR	CPRI /25GBASE-LR Lite application 0~70°C	9.8304G、 10.1376G、 10.3125G、	DFB	SMF
SP-25E-LR-IDFR	CPRI /25GBASE-LR Lite application -40~85°C	24.33024G、 25.78125G		

Warnings

Handling Precautions: This device is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended. Follow guidelines according to proper ESD procedures.

Laser Safety: Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation.

Legal Notice

IMPORTANT NOTICE!

All information contained in this document is subject to change without notice, at Source Photonics' sole and absolute discretion. Source Photonics warrants performance of its products to current specifications only in accordance with the company's standard one-year warranty; however, specifications designated as "preliminary" are given to describe components only, and Source Photonics expressly disclaims any and all warranties for said products, including express, implied, and statutory warranties, warranties of merchantability, fitness for a particular purpose, and non-infringement of proprietary rights. Please refer to the company's Terms and Conditions of Sale for further warranty information.

Source Photonics assumes no liability for applications assistance, customer product design, software performance, or infringement of patents, services, or intellectual property described herein. No license, either express or implied, is granted under any patent right, copyright, or intellectual property right, and Source Photonics makes no representations or warranties that the product(s) described herein are free from patent, copyright, or intellectual property rights. Products described in this document are NOT intended for use in implantation or other life support applications where malfunction may result in injury or death to persons. Source Photonics customers using or selling products for use in such applications do so at their own risk and agree to fully defend and indemnify Source Photonics for any damages resulting from such use or sale.

© Copyright Source Photonics, Inc. 2007-2021

All Rights Reserved.

All information contained in this document is subject to change without notice. The products described in this document are NOT intended for use in implantation or other life support applications where malfunction may result in injury or death to persons.

The information contained in this document does not affect or change Source Photonics product specifications or warranties. Nothing in this document shall operate as an express or implied license or indemnity under the intellectual property rights of Source Photonics or third parties. All information contained in this document was obtained in specific environments, and is presented as an illustration. The results obtained in other operating environments may vary.

THE INFORMATION CONTAINED IN THIS DOCUMENT IS PROVIDED ON AN "AS IS" BASIS. In no event will Source Photonics be liable for damages arising directly from any use of the information contained in this document.

Contacts

US Headquarters

8521 Fallbrook Ave, Suite 200
West Hills, CA 91306, USA
Tel: +1(818) 773-9044
Fax: +1(818) 576-9486

China

Building #2&5, West Export Processing
Zone No. 8 Kexin Road, Hi-Tech Zone
Chengdu, 611731, China
Tel: +86-28-8795-8788
Fax: +86-28-8795-8789

Taiwan

9F, No 81, Shui Lee Rd.
Hsinchu, Taiwan R.O.C.
Tel: +886-3-5169222
Fax: +886-3-5169213

www.sourcephotonics.com