SDH STM-1/SONET OC-3
SFF Transceiver

Features:

- Compliant with 155 Mbps ATM and SONET OC-3 SDH STM- 1 (S1. 1)
- Distance up to 2km-15km
- Industry standard 2 ×5 footprint
- Differential LVPECL inputs and outputs
- Single 3.3V Power supply
- Duplex LC Connector Interface
- Operating Case Temperature
  Standard: -5℃ ~+70℃
  Industrial: -40℃ ~+85℃

Applications:

- Fast Ethernet Switches and Routers
- SDH/ STM-1, SONET/OC-3
- Other Optical Link

Product Description

The SDH STM-1/SONET OC-3 SFF optical transceivers are high performance, cost effective modules. They offer the customer a range of design options, standard or industrial temperature ranges. They are designed to provide SONET/SDH compliant connections for 155 Mbps at short, intermediate and long reach links. These transceivers are qualified in accordance with GR-468-CORE.

Ordering information

Part No.	Data Rate	Laser	Fiber Type	Distance*Note1	Optical Interface	Temp. *Note2	DDMI
TFS-0302-31NCR	155.52M	1310nm-FP	MMF	2Km	LC	ST	NO
TFS-0302-31NIR	155.52M	1310nm-FP	MMF	2Km	LC	IT	NO
TFS-0315-31NCR	155.52M	1310nm-FP	SMF	15Km	LC	ST	NO
TFS-0315-31NIR	155.52M	1310nm-FP	SMF	15Km	LC	IT	NO

Note1: 2Km with 50/125μm MMF, 15/40/80/120Km with 9/125μm SMF

Note2: ST: -5 ~ +75deg C IT: -40 ~ +85 deg C.

Regulatory Compliance

Feature	Standard	Performance
Electrostatic Discharge (ESD) to the Electrical Pins	MIL-STD-883G Method 3015.7	Class 1C (>1000 V)
Electrostatic Discharge to the enclosure	EN 55024:1998+A1+A2 IEC-61000-4-2 GR-1089-CORE	Compliant with standards
Electromagnetic Interference (EMI)	FCC Part 15 Class B EN55022:2006 CISPR 22B :2006 VCCI Class B	Compliant with standards Noise frequency range: 30 MHz to 6 GHz. Good system EMI design practice required to achieve Class B margins. System margins depend on customer host board and chassis design.
Immunity	EN 55024:1998+A1+A2 IEC 61000-4-3	Compliant with standards. 1kHz sine-wave, 80% AM, from 80 MHz to 1 GHz. No effect on transmitter/receiver performance is detectable between these limits.
Laser Eye Safety	FDA 21CFR 1040.10 and 1040.11 EN (IEC) 60825-1:2007 EN (IEC) 60825-2:2004+A1 EN (IEC) 60950-1:2006+A1+A11+A12	CDRH compliant and Class I laser product. TUV Certificate No. R50271605
Component Recognition	UL and CUL EN60950-1:2006	TUV Certificate No. E344594 (CB:JPTUV-053877)
RoHS2.0	2011/65/EU	Compliant with standards

Note: For update of the equipment and strict control of raw materials, Trixon has the ability to supply the customized products since Sep.2008, which meets the requirements of RoHS6 (Restrictions on use of certain Hazardous Substances) of European Union.

Absolute Maximum Ratings*Note3

Parameter	Symbol	Min	Max	Unit
Storage Temperature	T_S	-40	+85	°C
Supply Voltage	V_{CC}	0	3.6	V
Operating Humidity	-	5	95	%

Note3: Exceeding any one of these values may destroy the device permanently.

Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Operating Case Temperature	T_C	-5		70	°C	ST
		-40		85	°C	IT
Power Supply Voltage	V_{CC}	3.14	3.3	3.47	V	
Bit Rate			155.52	200	Mbps	
Supply Current	I_{CC}			120	mA	

Performance Specifications – Electrical

Parameter	Symbol	Min	Typ.	Max	Unit	Notes
Transmitter						
Disable input voltage-High		2			V	
Disable input voltage-Low		0		0.6	V	
PECL/CML/LVDS input (differential)	Vin	100		2000	mVpp	AC-Coupling
Receiver						
Signal Detect Output voltage - High		2.2		2.6	V	PECL
Signal Detect Output voltage - High		2.4			V	TTL
Signal Detect Output voltage - Low		1.3		1.8	V	PECL
Signal Detect Output voltage - Low				0.4	V	TTL
PECL Data Output (Differential)		600		1600	mVpp	AC-Coupling

Performance Specifications – Optical

(1310nm FP and PIN， 2km)

Parameter	Symbol	Min	Typ.	Max	Unit	Note
Transmitter						
Centre Wavelength	λc	1280	1310	1340	nm	
Spectral Width*[Note4]	Δλ			4	nm	FP-LD
Average Output Power	P_{OUT}	-20		-14	dBm	62.5/125 μm fiber
Average Output Power	P_{OUT}	−23.5		-14	dBm	50/125 μm fiber
Extinction Ratio	ER	9			dB	
Average Power of OFF Transmitter	P_{OFF}			-40	dBm	
Output Optical Eye	Compliant with eye mask Telcordia GR-253-CORE and ITU-T G.957					
Receiver						
Centre Wavelength	λc	1200		1650	nm	
Sensitivity*[Note5]	P_{IN}			-31	dBm	
Receiver Overload	Overload	0			dBm	
Optical Return Loss		12			dB	
Signal Detect-Asserted				-29	dBm	
Signal Detect-Deasserted		-45			dBm	
Signal Detect-Hysteresis		0.5			dB	

（1310nm FP and PIN， 15km）

Parameter	Symbol	Min	Typ.	Max	Unit	Note
Transmitter						
Centre Wavelength	λc	1280	1310	1340	nm	
Spectral Width* Note4	Δλ			4	nm	FP-LD
Average Output Power	P_{OUT}	-15		-8	dBm	
Extinction Ratio	ER	9			dB	
Average Power of OFF Transmitter	P_{OFF}			-40	dBm	
Output Optical Eye	Compliant with eye mask Telcordia GR-253-CORE and ITU-T G.957					
Receiver						
Centre Wavelength	λc	1200		1650	nm	
Sensitivity* Note5	P_{IN}			-31	dBm	
Receiver Overload	Overload	0			dBm	
Optical Return Loss		12			dB	
Signal Detect-Asserted				-29	dBm	
Signal Detect-Deasserted		-45			dBm	
Signal Detect-Hysteresis		0.5			dB	

Note4: VSCEL LD and FP LD measured spectral width RMS, DFB LD measured spectral width –20dB.

Note5: Minimum average optical power measured at the BER less than 1E-10@pattern is $PRBS2^{23}$-1@ER=10dB.

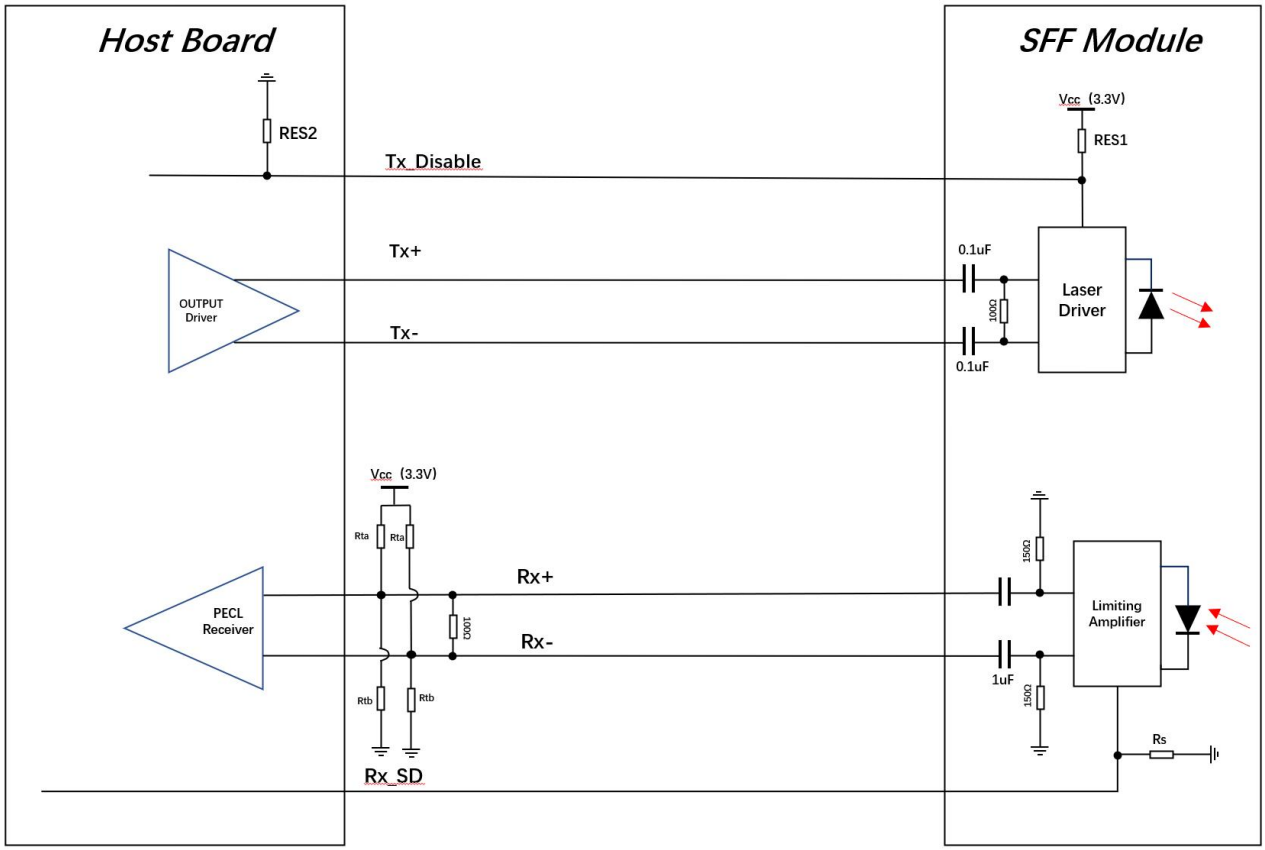
SFF Transceiver Electrical Pad Layout

Pin Function Definitions

Pin Num.	Name	Function
1	RX GND	Receiver Signal Ground
2	VCCR	Receiver Power Supply
3	SD	Signal Detect Output “1” - “Signal valid”, “0” – “Lose of signal”
4	RD–	Inv. Received Data Out

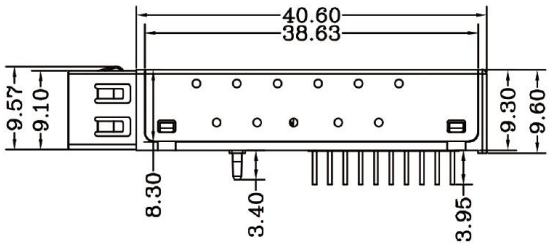
5	RD+	Received Data Out
6	VCCT	Transmitter Power Supply
7	TX GND	Transmitter Signal Ground
8	TXDIS	Transmitter Disable (LVTTL), "1" – Disable, "0" – Enable
9	TD+	Transmitter Data In
10	TD–	Transmitter Data In-Bar

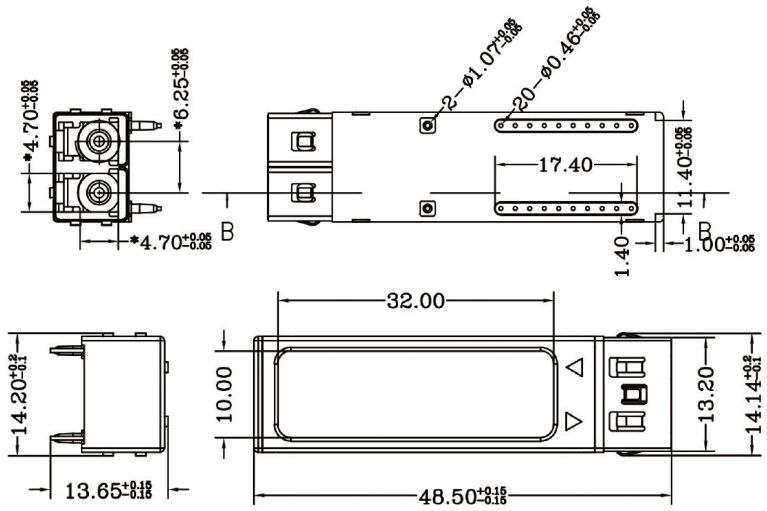
Recommended Circuit



Rta=2.7kΩ RES1=4.7kΩ to 10kΩ
Rtb=4.3kΩ if Tx_Disable is not used RES2 =0Ω
Rs=130Ω if Tx_Disable is controlled by MCU, RES2=NC

Mechanical Dimension





Eye Safety

This single-mode transceiver is a Class 1 laser product. It complies with IEC-60825 and FDA 21 CFR 1040.10 and 1040.11. The transceiver must be operated within the specified temperature and voltage limits. The optical ports of the module shall be terminated with an optical connector or with a dust plug.

Obtaining Document

You can visit our website:http://www.trixontech.com
Or contact Trixon Inc. listed at the end of the documentation to get the latest document.

Notice

Trixon reserves the right to make changes to or discontinue any optical link product or service identified in this publication, without notice, in order to improve design and/or performance.
Applications that are described herein for any of the optical link products are for illustrative purposes only. Trixon makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

Add: # 202, Section A, Building 1 No.209, Sanse Road, Jinjiang District Industry Park Chengdu 610063. Sichuan P.R. CHINA

Tel: (+86) 028-85925400/Fax: (+86) 028-85925445
E-mail: info@trixontech.com
http://www.trixontech.com