

125M/155M Dual SC, 1310nm FP 1X9 Transceiver, LVPECL/PECL SD



Features:



- Compliant with IEEE802.3ah 100BASE-LX10
- Compliant with SDH/ STM-1, SONET/OC-3
- Industry Standard 1X9 Footprint
- Distance up to 2km-20km
- Differential LVPECL inputs and outputs
- Single 3.3V or 5V Power supply
- Duplex SC Connector Interface
- Operating Case Temperature
Standard: -5°C ~+70°C
Industrial: -40°C ~+85°C

Applications:

- Fast Ethernet 100BASE-LX10@125M
- SDH/ STM-1, SONET/OC-3
- Switches and Routers
- Other Optical Link

Product Description

The 125M/155M Dual SC, 1310nm FP 1X9 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 Fast Ethernet 100BASE-LX10 and SONET/SDH compliant connections for 125M/155 Mbps at short 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	SC	ST	NO
TFS-0302-31NIR	155.52M	1310nm-FP	MMF	2Km	SC	IT	NO
TFS-0315-31NCR	155.52M	1310nm-FP	SMF	20Km	SC	ST	NO
TFS-0315-31NIR	155.52M	1310nm-FP	SMF	20Km	SC	IT	NO

Note1: 2Km with 50/125µm MMF, 20/40/80/120Km 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		125	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)	V_{in}	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	λ_C	1280	1310	1340	nm	
Spectral Width* ^{Note4}	$\Delta\lambda$			4	nm	FP-LD
Average Output Power	P_{OUT}	-20		-14	dBm	62.5/125 μ m fiber
Average Output Power	P_{OUT}	-23.5		-14	dBm	50/125 μ m 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	λ_C	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	

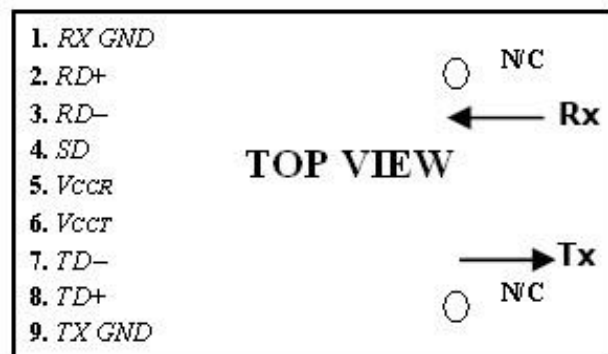
(1310nm FP and PIN · 20km)

Parameter	Symbol	Min	Typ.	Max	Unit	Note
Transmitter						
Centre Wavelength	λ_c	1280	1310	1340	nm	
Spectral Width* ^{Note4}	$\Delta\lambda$			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	λ_c	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 PRBS2²³-1@ER=10dB.

SFF Transceiver Electrical Pad Layout



Pin Function Definitions

Pin	Name	Function / Description
1	RX GND	Receiver Signal Ground
2	RD+	Receiver Data Out
3	RD-	Receiver Data Out Bar
4	SD	Signal Detect(1)
5	VccR	Receiver Power Supply
6	VccT	Transmitter Power Supply

7	TD-	Transmitter Data In Bar
8	TD+	Transmitter Data In
9	TX GND	Transmitter Signal Ground

Note1: Signal Detect is a basic fiber failure indicator. This is a single-ended LVPECL/PECL output. As the input optical power is decreased, Signal Detect will switch from high to low (de-assert point) somewhere between sensitivity and the no light input level. As the input optical power is increased from very low levels, Signal Detect will switch back from low to high (assert point)

Recommended Circuit

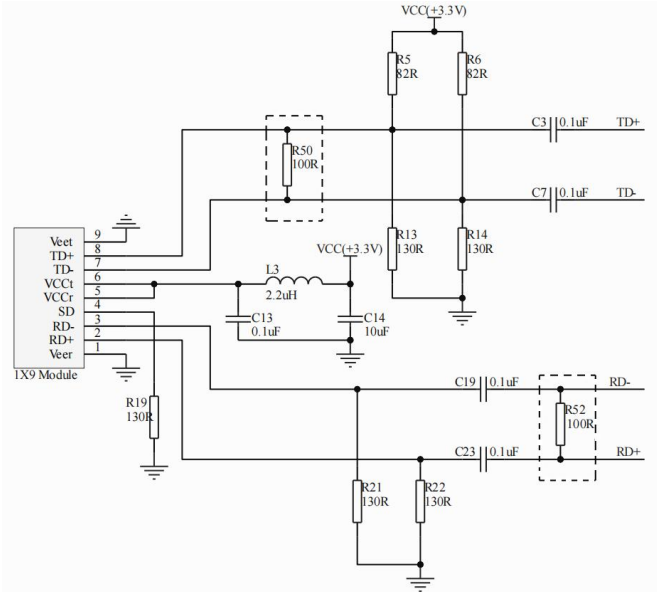


Figure 1 : 3.3V SD LVPECL

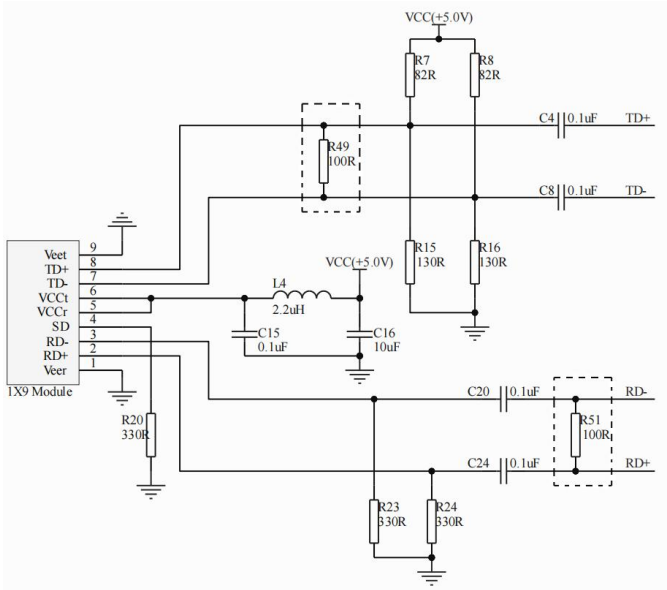
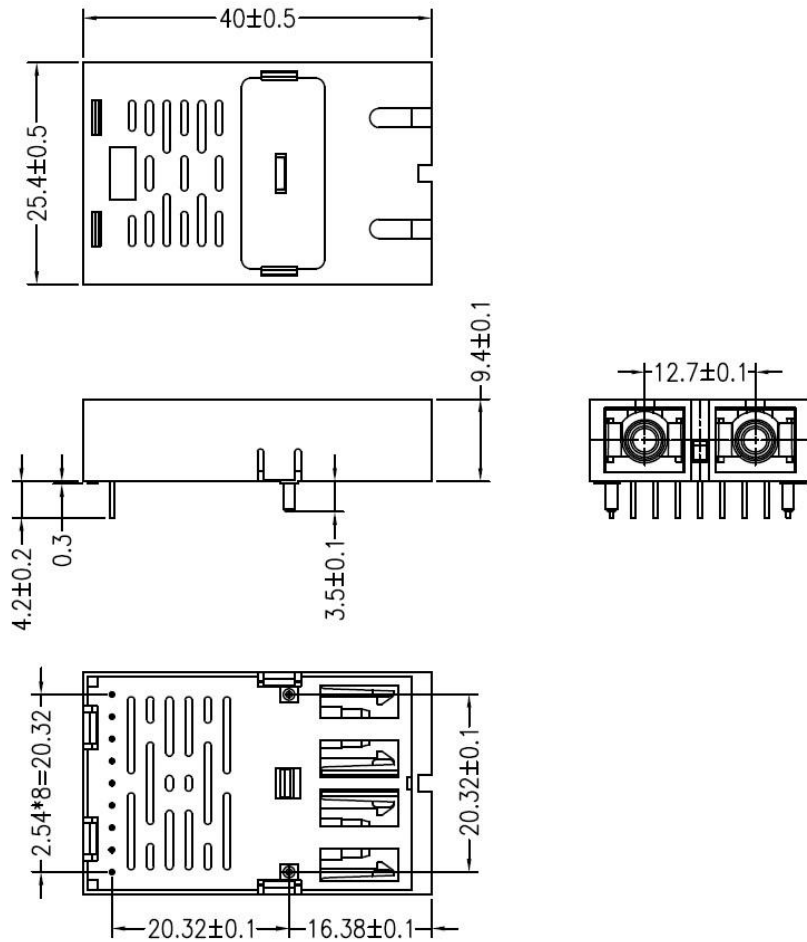


Figure 2: 5V SD PECL

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

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