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SKU: 05S0001

Ultra-Low Data-Rate 1X9 DC~4Mbps Transceiver
1310nm FP, SMF 20KM, LVTTL Signal Input / Output

Part Number: F1X9-0x-S13-20-L4T

Overview

F1X9-0x-S13-20-L4T 1X9 SIP package style transceivers are compliant with the industrial standard specification. The high performance uncooled 1310nm FP transmitter and high sensitivity PIN receiver provide superior performance for Ultra-Low Data-Rate applications such as RS232 / RS422 / RS485 and IEEE C37.94 / IEC 62843 up to SMF 20km optical links.

Applications

- Ultra-Low Data-Rate DC~4Mbps
- RS232 / RS422 / RS485
- IEEE C37.94 / IEC 62843
- Fiber Monitor System
- Industrial Control System
- V.35(RS449)/X.21/G.703(E1)

Features

- Industry Standard 1x9 Footprint
- 1310nm FP laser transmitter
- Duplex SC, FC, ST connector
- Single 3.3V Power Supply
- DC-coupled LVTTL inputs and outputs
- No Signal Detection Pin
- Wave Solderable and Aqueous Washable
- Link distance 20km over SM fiber
- RoHS Compliant

Laser Safety

- This is a Class 1 Laser Product complies with 21 CFR 1040.10 and 1040.11 except for conformance with IEC 60825-1 Ed. 3., as described in Laser Notice No. 56, dated May 8, 2019.
- Caution: Use of control or adjustments or performance of procedure other than those specified herein may result in hazardous radiation exposure.

Absolute Maximum Ratings

Parameters	Symbol	Min.	Max.	Unit
Storage Temperature	Tst	-40	+85	°C
Storage Relative Humidity	RH	5	95	%
Supply Voltage	Vcc	0	+4.5	V

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Recommended Operating Conditions

Parameters	Symbol	Min.	Typ.	Max.	Unit
Case Operating Temp. (F1X9-0x-S13-20-L4T)	TOP	0	-	+70	°C
Case Operating Temp. (F1X9-0x-S13-20i-L4T)	TOP	-40	-	+85	°C
Supply Voltage	VCC	+3.13	+3.3	+3.47	V
Data Rate	DR	DC		4	Mb/s
Supply Current	ICC		100	150	mA
Power Consumption (+3.3V)	P			0.5	W
Lead Soldering Limits	Tsold			260/10	°C/Sec

Transmitter Electro-optical Characteristics

V_{CC} = 3.13V to 3.47V, T_{OP} = 0 °C to 70 °C (F1X9-0x-S13-20-L4T); **T_{OP} = -40 °C to 85 °C** (F1X9-0x-S13-20i-L4T)

Parameters	Symbol	Min.	Typ.	Max.	Unit	Note
Operating Data Rate	DR	DC		4	Mb/s	
Optical Launch Power	Po	-12		-5	dBm	1
Optical Center Wavelength	λc	1260	1310	1360	nm	
Spectral Width (RMS)	Δλ			4	nm	
Optical Extinction Ratio	ER	10			dB	
Data Input Voltage High	VOH	2.4		Vcc	V	
Data Input Voltage Low	VOL	GND		0.7	V	

Note1: The optical power is launched into a 9/125μm single mode fiber.

Receiver Electro-optical Characteristics

V_{CC} = 3.13V to 3.47V, T_{OP} = 0 °C to 70 °C (F1X9-0x-S13-20-L4T); **T_{OP} = -40 °C to 85 °C** (F1X9-0x-S13-20i-L4T)

Parameters	Symbol	Min.	Typ.	Max.	Unit	Note
Operating Data Rate	DR	DC		4	Mb/s	
Receiver Sensitivity	SEN			-25	dBm	1
Maximum Receive Power	PRx-MAX	-5			dBm	
Optical Center Wavelength	λc	1260		1620	nm	
Data Output Voltage High	VOH	2.4		Vcc	V	
Data Output Voltage Low	VOL	GND		0.4	V	

Note1: Measured with a PRBS 2^{10}-1 test pattern @4Mbps BER<10^{-10}.

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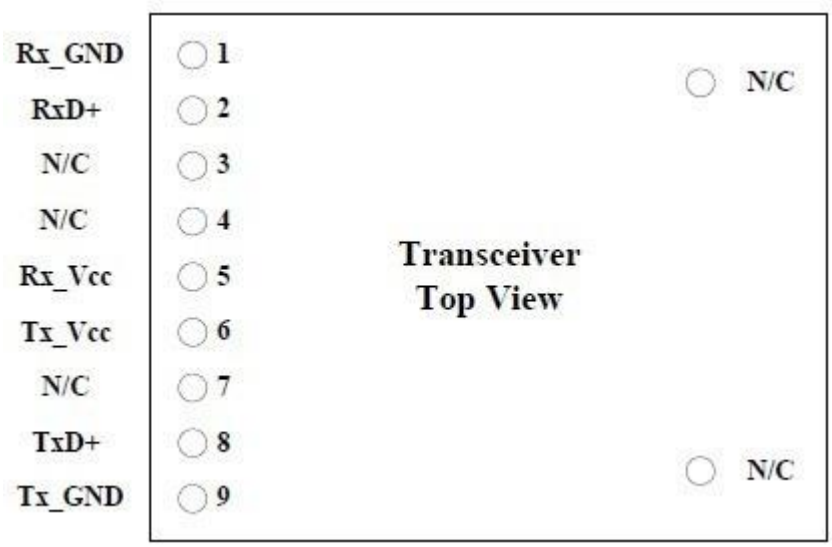
Pin Assignment



Pin Description

Pin	Name	Function / Description
1	Rx_GND	Receiver Signal Ground
2	RxD+	Receiver Data Out, RD+ is used to LVTTL output
3	N/C	Non-Connection
4	N/C	Non-Connection
5	Rx_Vcc	Receiver Power Supply
6	Tx_Vcc	Transmitter Power Supply
7	N/C	Non-Connection
8	TxD+	Transmitter Data In, TxD+ is used to LVTTL input
9	Tx_GND	Transmitter Signal Ground

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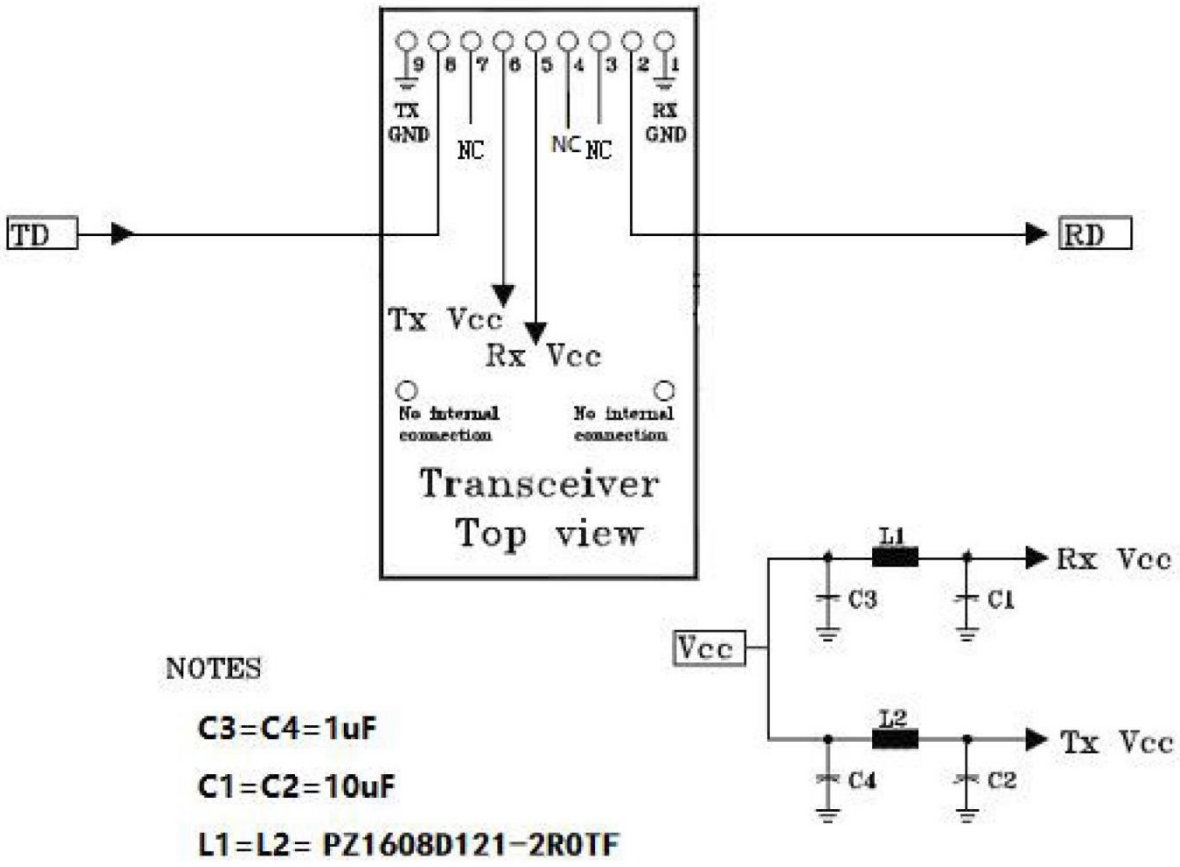
Recommended Circuit



NOTES

C3=C4=1uF

C1=C2=10uF

L1=L2= PZ1608D121-2R0TF

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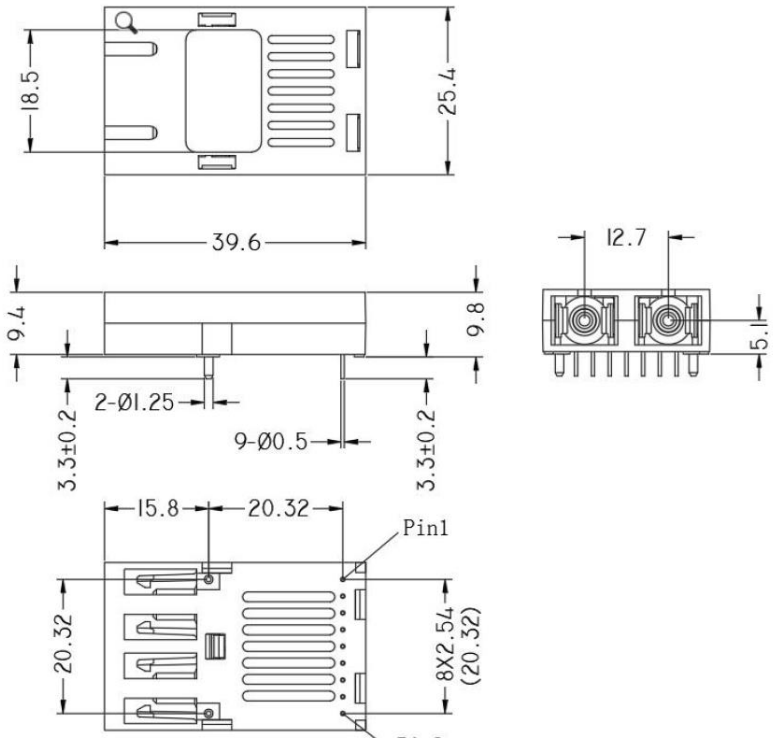
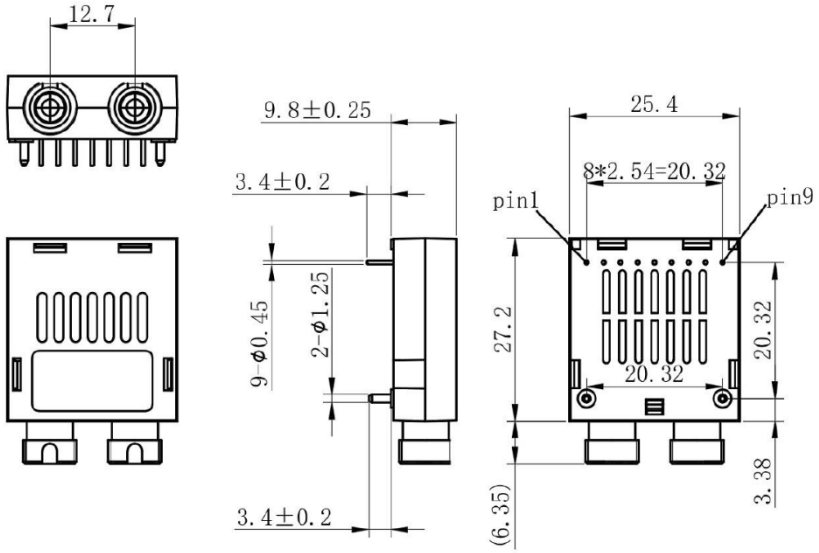
Mechanical Dimensions

(1) SC Connector Type



(2) FC Connector Type



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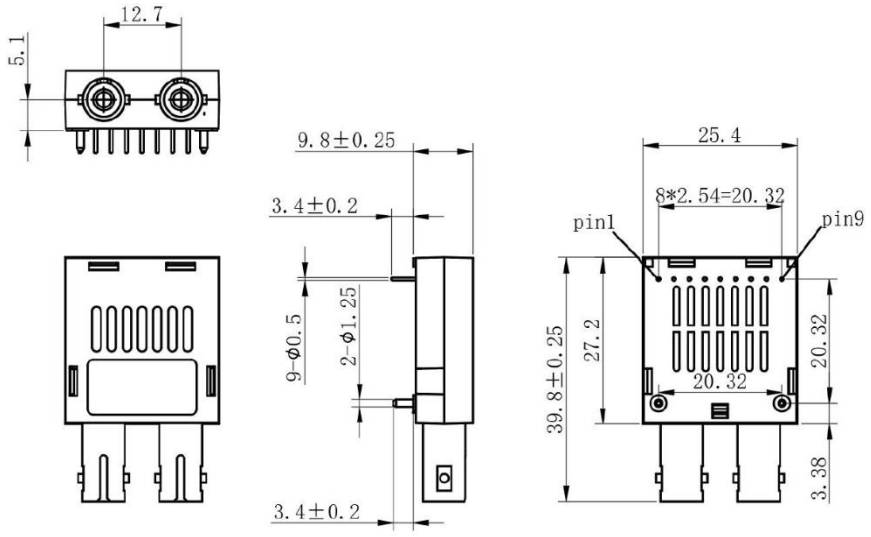
(3) ST Connector Type



(All Dimensions are ±0.20mm Unless Otherwise Specified, Unit: mm)

Ordering Information

Part No.	Tx	Rx	Conn.	I/O	Link	Voltage	Temp.
F1X9-01-S13-20-L4T	1310nm	1260nm ~ 1620nm	SC	DC/DC LVTTL	SMF 20km	3.3V	0~70°C
F1X9-01-S13-20i-L4T							-40~85°C
F1X9-03-S13-20-L4T			FC				0~70°C
F1X9-03-S13-20i-L4T							-40~85°C
F1X9-0M-S13-20-L4T			ST				0~70°C
F1X9-0M-S13-20i-L4T							-40~85°C

Note: Distances are indicative only. To calculate a more precise link budget based on specific conditions in your application, please refer to the optical characteristics.