



125M / 155M 1X9-100LX20 Transceiver

Duplex SC, 1310nm FP, SMF 20KM, LVPECL / PECL Signal Detection

Part Number: F1X9-A1-S13-20P



Overview

F1X9-A1-S13-20P 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 SDH STM-1 / SONET OC-3 and Fast Ethernet applications up to SMF 20km optical links

Applications

- Fast Ethernet 100BASE-LX10 @125M
- SDH STM-1 / SONET OC-3 @155M

Features

- Compatible with IEEE802.3ah 100BASE-LX10
- Compatible with SDH STM-1 S1.1 and SONET OC-3 IR-1
- Industry Standard 1x9 Footprint
- 1310nm FP laser transmitter
- Duplex SC connector
- Single 3.3V or 5V Power Supply
- DC-coupled Differential LVPECL inputs and outputs
- LVPECL / PECL Signal Detection Output
- 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	T _{ST}	-40	+85	°C
Storage Relative Humidity	RH	5	95	%
Supply Voltage (F1X9-A1-S13-20P)	V _{CC}	0	+4.5	V
Supply Voltage (F1X9-A1-S13-20P5)	V _{CC}	0	+6.0	V

Recommended Operating Conditions

Parameters	Symbol	Min.	Typ.	Max.	Unit
Case Operating Temp. (F1X9-A1-S13-20P)	T _{OP}	0	-	+70	°C
Case Operating Temp. (F1X9-A1-S13-20Pi)	T _{OP}	-40	-	+85	°C
Supply Voltage (F1X9-A1-S13-20P)	V _{CC}	+3.13	+3.3	+3.47	V
Supply Voltage (F1X9-A1-S13-20P5)	V _{CC}	+4.75	+5.0	+5.25	V
Supply Current (F1X9-A1-S13-20P)	I _{CC}			200	mA
Supply Current (F1X9-A1-S13-20Pi)	I _{CC}			250	mA
Lead Soldering Limits	T _{sold}			240/10	°C/Sec

Transmitter Electro-optical Characteristics

T_{OP} = 0 °C to 70 °C (F1X9-A1-S13-20P); T_{OP} = -40 °C to 85 °C (F1X9-A1-S13-20Pi)

Parameters	Symbol	Min.	Typ.	Max.	Unit	Note
Operating Data Rate	DR		125	155	Mb/s	
Optical Launch Power	P _o	-15		-3	dBm	1
Optical Center Wavelength	λ _c	1260	1310	1360	nm	
Spectral Width (RMS)	Δλ			4	nm	
Optical Extinction Ratio	ER	8.2			dB	
Optical Eye Mask		IEEE802.3ah and ITU-T G.957				
Rise/Fall Time (20%~80%)	Tr/Tf					
Relative Intensity Noise	RIN			-116	dB/Hz	
Differential Data Input Swing	V _{IN}	500		2400	mV	

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



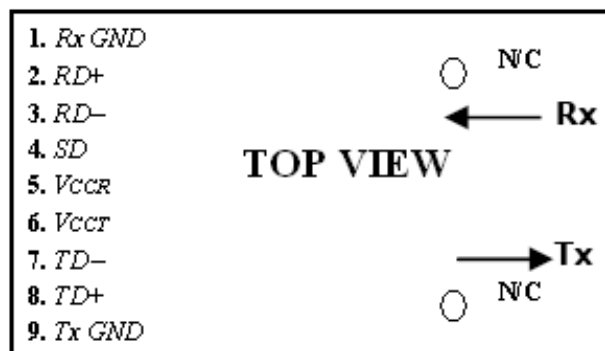
Receiver Electro-optical Characteristics

T_{OP} = 0 °C to 70 °C (F1X9-A1-S13-20P); T_{OP} = -40 °C to 85 °C (F1X9-A1-S13-20Pi)

Parameters	Symbol	Min.	Typ.	Max.	Unit	Note
Operating Data Rate	DR		125	155	Mb/s	
Receiver Sensitivity	SEN			-32	dBm	1
Maximum Receive Power	P _{RX-MAX}	-3			dBm	1
Optical Center Wavelength	λ_c	1260		1620	nm	
Signal Detect Assert	SD _A			-33	dBm	
Signal Detect De-Assert	SD _D	-45			dBm	
Signal Detect Hysteresis	SD _{HY}	1		5	dB	
Differential Data Output Swing	V _{OUT}	370		2000	mV	
Signal Detect O/P Voltage Low	V _{SDL-VCC}	-2000		-1580	mV	
Signal Detect O/P Voltage High	V _{SDH-VCC}	-1100		-740	mV	

Note1: Measured with a PRBS 2²³-1 test pattern @155Mbps BER<10⁻¹².

Pin Assignment

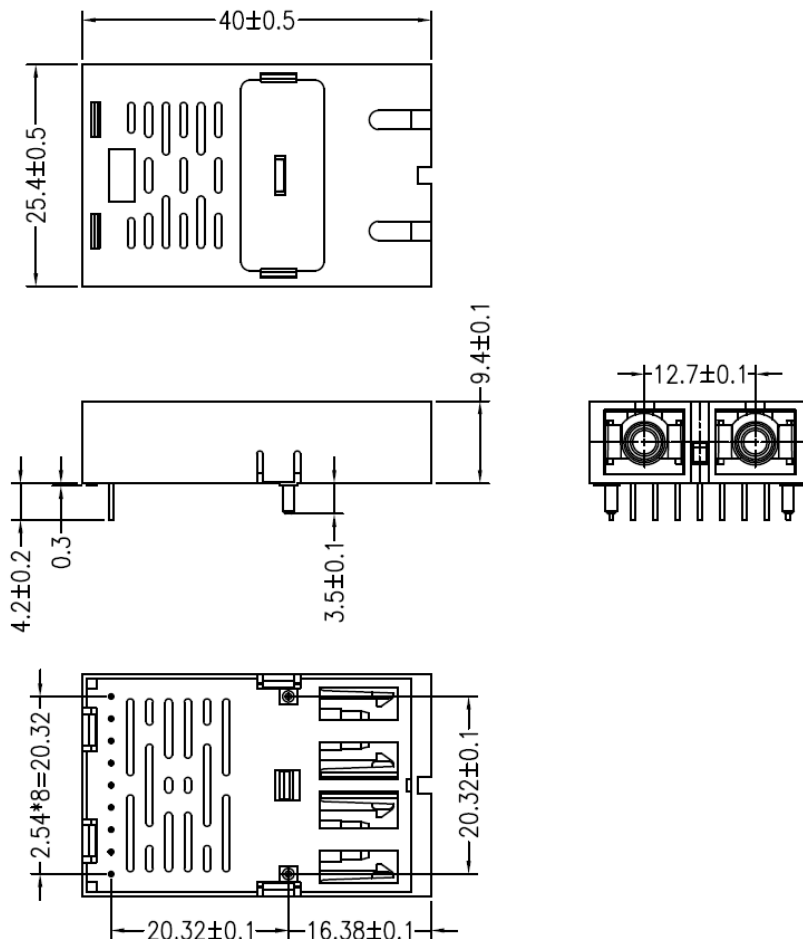


Pin Description

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).

Mechanical Dimensions



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

Ordering Information

Part No.	Tx	Rx	Conn.	I/O	SD	Link	Voltage	Temp.
F1X9-A1-S13-20P	1310nm	1260nm ~ 1620nm	SC	DC/DC	LVPECL	SMF 20km	3.3V	0~70°C
F1X9-A1-S13-20Pi					LVPECL		3.3V	-40~85°C
F1X9-A1-S13-20P5					PECL		5V	0~70°C
F1X9-A1-S13-20P5i					PECL		5V	-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.