



125M / 155M 1X9-100ZX80 Transceiver

Duplex SC/FC/ST, CWDM DFB, SMF 31dB, LVPECL / PECL Signal Detection

Part Number: F1X9-Ax-Cxx-b31P



Overview

F1X9-Ax-Cxx-b31 1X9 SIP package style transceivers are compliant with the industrial standard specification. The high performance uncooled CWDM DFB transmitter and high sensitivity PIN receiver provide superior performance for SDH STM-1 / SONET OC-3 and Fast Ethernet applications up to SMF 31dB budget optical links.

Applications

- 100BASE-ZX Ethernet
- SDH STM1 / SONET OC3
- CWDM Networks

Features

- Compatible with 100BASE-ZX
- Compatible with SDH STM1 and SONET OC3
- Industry Standard 1x9 Footprint
- CWDM DFB laser transmitter
- Duplex SC/ST/FC optical 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 budget 31dB 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-Ax-Cxx-b31P)	V _{CC}	0	+4.5	V
Supply Voltage (F1X9-Ax-Cxx-b31P5)	V _{CC}	0	+6.0	V

Recommended Operating Conditions

Parameters	Symbol	Min.	Typ.	Max.	Unit
Case Operating Temp. (F1X9-Ax-Cxx-b31P)	T _{OP}	0	-	+70	°C
Case Operating Temp. (F1X9-Ax-Cxx-b31Pi)	T _{OP}	-40	-	+85	°C
Supply Voltage (F1X9-Ax-Cxx-b31P)	V _{CC}	+3.13	+3.3	+3.47	V
Supply Voltage (F1X9-Ax-Cxx-b31P5)	V _{CC}	+4.75	+5.0	+5.25	V
Supply Current (F1X9-Ax-Cxx-b31P)	I _{CC}			200	mA
Supply Current (F1X9-Ax-Cxx-b31Pi)	I _{CC}			250	mA
Lead Soldering Limits	T _{sold}			260/10	°C/Sec
Data Rate	DR		125/155		Mbps

Transmitter Electro-optical Characteristics

T_{OP} = 0 °C to 70 °C (F1X9-Ax-Cxx-b31P); T_{OP} = -40 °C to 85 °C (F1X9-Ax-Cxx-b31Pi)

Parameters	Symbol	Min.	Typ.	Max.	Unit	Note
Operating Data Rate	DR		125	155	Mb/s	
Optical Launch Power	P _o	-3		+2	dBm	1
Optical Center Wavelength (0 °C to 70 °C)	λ _c	λ-6.5	λ	λc+6.5	nm	
Optical Center Wavelength (-40 °C to 85 °C)	λ _c	λ-7.5	λ	λc+7.5	nm	
Spectral Width (-20dB)	Δλ			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Optical Extinction Ratio	ER		10			
Optical Eye Mask		ITU-T G.957				
Rise/Fall Time (10%~90%)	T _r / T _f		1	2	ns	
Relative Intensity Noise	RIN			-116	dB/Hz	
Data Input Current-Low		-350			uA	



Data Input Current-Hight				350	uA	
Differential Data Input Swing	V _{IN}	300		2400	mV	

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

Receiver Electro-optical Characteristics

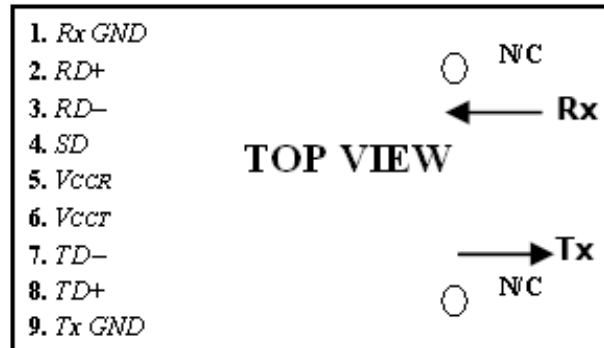
T_{OP} = 0 °C to 70 °C (F1X9-Ax-Cxx-b31P); T_{OP} = -40 °C to 85 °C (F1X9-Ax-Cxx-b31Pi)

Parameters	Symbol	Min.	Typ.	Max.	Unit	Note
Operating Data Rate	DR		125	155	Mb/s	
Receiver Sensitivity	SEN			-34	dBm	1
Maximum Receive Power	P _{Rx-MAX}	-3			dBm	1
Optical Center Wavelength	λ _c	1100		1620	nm	
Signal Detect De-Assert	SD _D			-35	dBm	
Signal Detect Assert	SD _A	-45			dBm	
Signal Detect Hysteresis	SD _{HY}	1		5	dB	
Differential Data Output Swing	V _{OUT}	300		1000	mV	
Data Output Voltage-Low	V _{OL-VCC}	-1830		-880	mV	
Data Output Voltage-Hight	V _{OH-VCC}	-1085		-1580	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

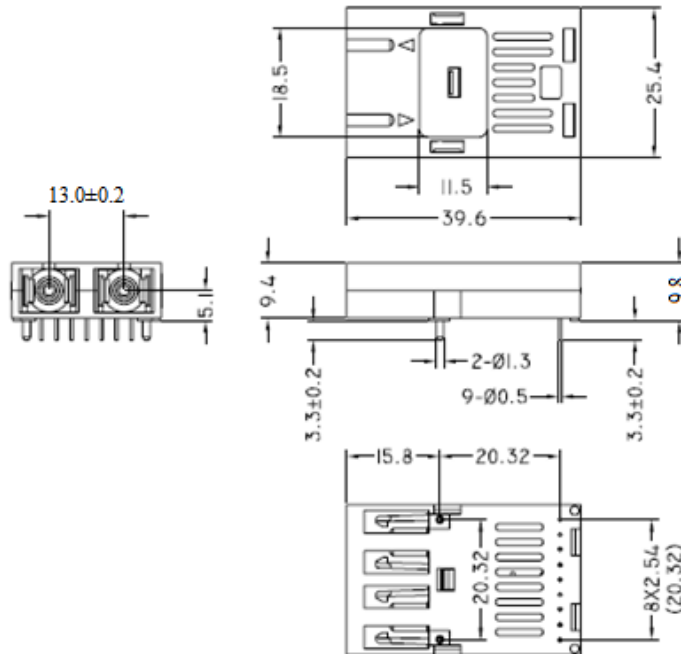
Pin	Name	Function / Description
1	Rx GND	Receiver Signal Ground
2	RD+	Receiver Data Out
3	RD-	Receiver Data Out Bar
4	SD	Signal Detect(1)
5	VccR	Receiver Power Supply
6	VccT	Transmitter Power Supply
7	TD-	Transmitter Data In Bar
8	TD+	Transmitter Data In
9	Tx GND	Transmitter Signal Ground

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).

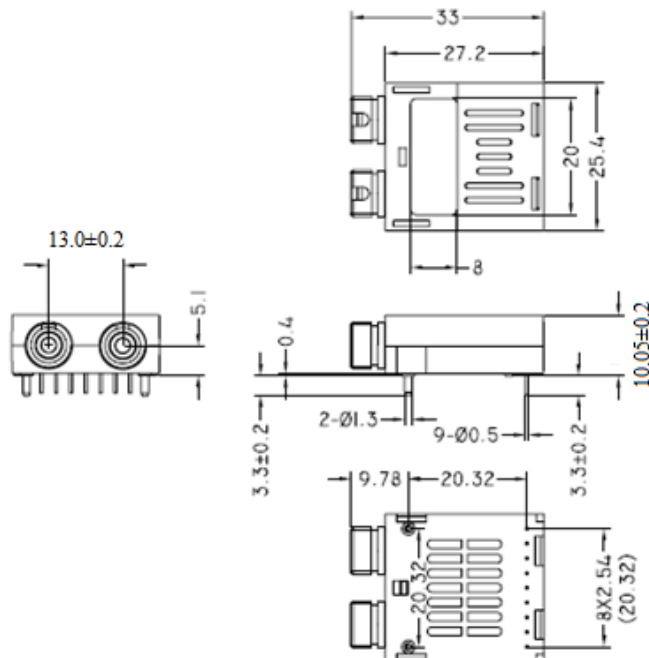


Mechanical Dimensions

(1) SC Connector Type

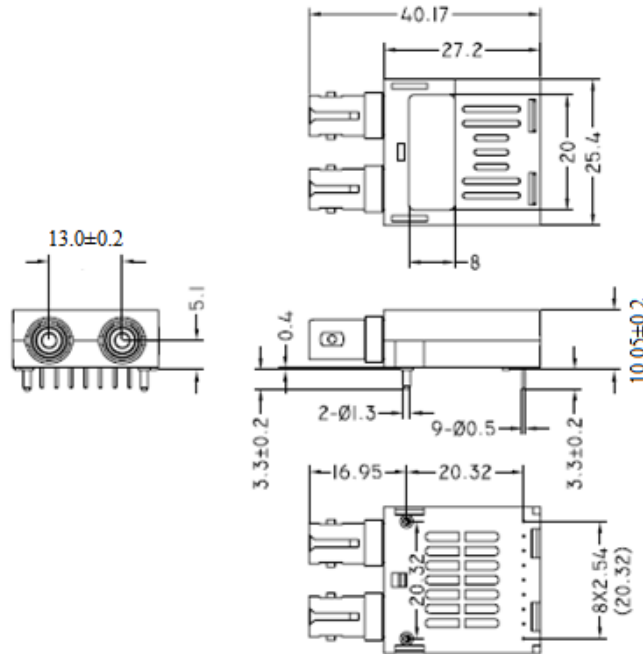


(2) FC Connector Type





(3) ST Connector Type



Ordering Information

Part No.	Tx (xx=)	Conn.	I/O	SD	Link	Voltage	Temp.
F1X9-A1-Cxx-b31P	27=1270nm	SC	DC/DC	LVPECL	SMF 31dB	3.3V	0~70°C
F1X9-A1-Cxx-b31Pi	29=1290nm 31=1310nm	SC	DC/DC	LVPECL	SMF 31dB	3.3V	-40~85°C
F1X9-A1-Cxx-b31P5	33=1330nm	SC	DC/DC	PECL	SMF 31dB	5V	0~70°C
F1X9-A1-Cxx-b31P5i	35=1350nm 37=1370nm	SC	DC/DC	PECL	SMF 31dB	5V	-40~85°C
F1X9-A3-Cxx-b31P	39=1390nm	FC	DC/DC	LVPECL	SMF 31dB	3.3V	0~70°C
F1X9-A3-Cxx-b31Pi	41=1410nm 43=1430nm	FC	DC/DC	LVPECL	SMF 31dB	3.3V	-40~85°C
F1X9-A3-Cxx-b31P5	45=1450nm	FC	DC/DC	PECL	SMF 31dB	5V	0~70°C
F1X9-A3-Cxx-b31P5i	47=1470nm 49=1490nm	FC	DC/DC	PECL	SMF 31dB	5V	-40~85°C
F1X9-AM-Cxx-b31P	51=1510nm	ST	DC/DC	LVPECL	SMF 31dB	3.3V	0~70°C
F1X9-AM-Cxx-b31Pi	53=1530nm 55=1550nm	ST	DC/DC	LVPECL	SMF 31dB	3.3V	-40~85°C
F1X9-AM-Cxx-b31P5	57=1570nm	ST	DC/DC	PECL	SMF 31dB	5V	0~70°C
F1X9-AM-Cxx-b31P5i	59=1590nm 61=1610nm	ST	DC/DC	PECL	SMF 31dB	5V	-40~85°C