FICER Technology Co., Ltd.
明虹科技股份有限公司
2F, No.138, Daye Rd., Beitou Dist.,
Taipei City 11268, Taiwan
www.Ficer.com

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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.

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Absolute Maximum Ratings

Parameters	Symbol	Min.	Max.	Unit
Storage Temperature	TST	-40	+85	°C
Storage Relative Humidity	RH	5	95	%
Supply Voltage (F1X9-Ax-Cxx-b31P)	VCC	0	+4.5	V
Supply Voltage (F1X9-Ax-Cxx-b31P5)	VCC	0	+6.0	V

Recommended Operating Conditions

Parameters	Symbol	Min.	Typ.	Max.	Unit
Case Operating Temp. (F1X9-Ax-Cxx-b31P)	TOP	0	-	+70	°C
Case Operating Temp. (F1X9-Ax-Cxx-b31Pi)	TOP	-40	-	+85	°C
Supply Voltage (F1X9-Ax-Cxx-b31P)	VCC	+3.13	+3.3	+3.47	V
Supply Voltage (F1X9-Ax-Cxx-b31P5)	VCC	+4.75	+5.0	+5.25	V
Supply Current (F1X9-Ax-Cxx-b31P)	ICC			200	mA
Supply Current (F1X9-Ax-Cxx-b31Pi)	ICC			250	mA
Lead Soldering Limits	Tsold			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	Po	-3		+2	dBm	1
Optical Center Wavelength (0 °C to 70 °C)	λc	λ-6.5	λ	λc+6.5	nm	
Optical Center Wavelength (-40 °C to 85 °C)	λc	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%)	Tr / Tf		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.

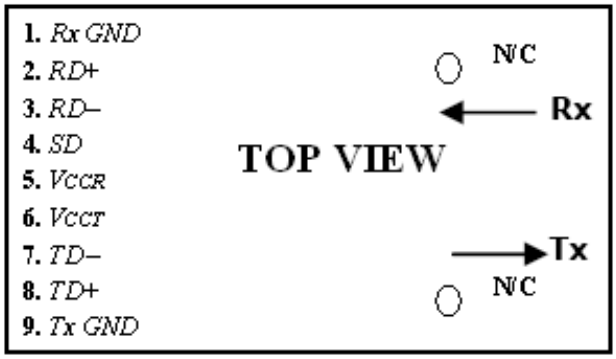
Receiver Electro-optical Characteristics

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	λc	1100		1620	nm	
Signal Detect Assert	SD_A			-35	dBm	
Signal Detect De-Assert	SD_D	-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}-V_{CC}	-1830		-880	mV	
Data Output Voltage-Hight	V_{OH}-V_{CC}	-1085		-1580	mV	
Signal Detect O/P Voltage Low	V_{SDL}-V_{CC}	-2000		-1580	mV	
Signal Detect O/P Voltage High	V_{SDH}-V_{CC}	-1100		-740	mV	

Note1: Measured with a PRBS 2^{23}-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).

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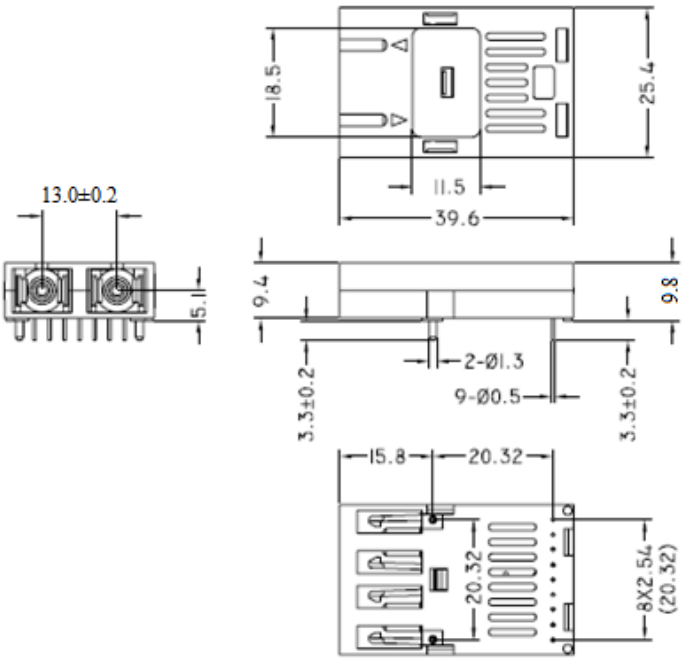
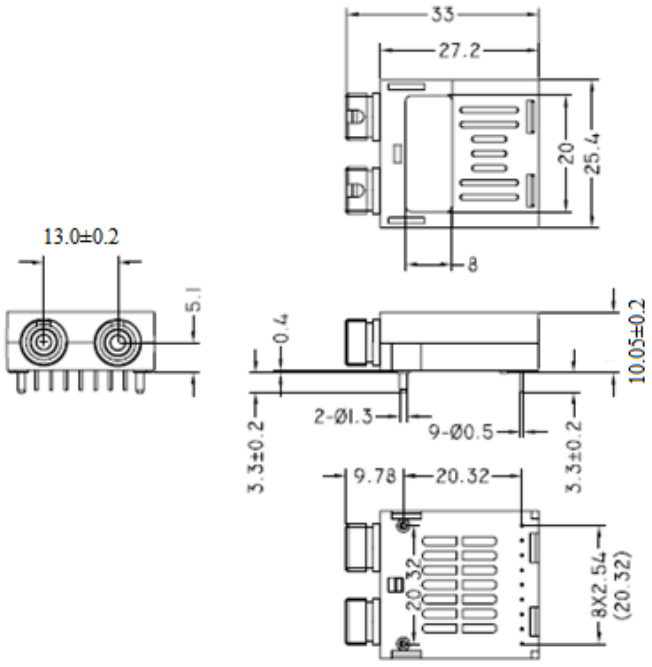
Mechanical Dimensions

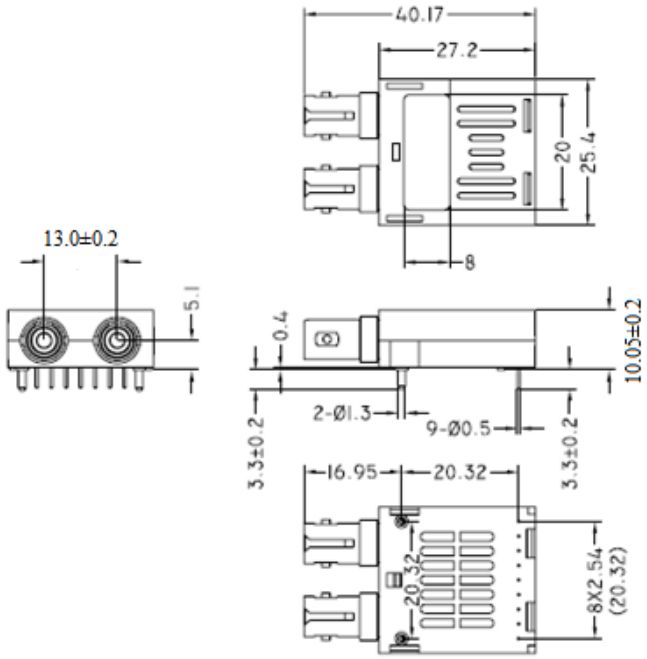
(1) SC Connector Type



(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 29=1290nm 31=1310nm 33=1330nm 35=1350nm 37=1370nm 39=1390nm 41=1410nm 43=1430nm 45=1450nm 47=1470nm 49=1490nm 51=1510nm 53=1530nm 55=1550nm 57=1570nm 59=1590nm 61=1610nm	SC	DC/DC	LVPECL	SMF 31dB	3.3V	0~70°C
F1X9-A1-Cxx-b31Pi		SC	DC/DC	LVPECL	SMF 31dB	3.3V	-40~85°C
F1X9-A1-Cxx-b31P5		SC	DC/DC	PECL	SMF 31dB	5V	0~70°C
F1X9-A1-Cxx-b31P5i		SC	DC/DC	PECL	SMF 31dB	5V	-40~85°C
F1X9-A3-Cxx-b31P		FC	DC/DC	LVPECL	SMF 31dB	3.3V	0~70°C
F1X9-A3-Cxx-b31Pi		FC	DC/DC	LVPECL	SMF 31dB	3.3V	-40~85°C
F1X9-A3-Cxx-b31P5		FC	DC/DC	PECL	SMF 31dB	5V	0~70°C
F1X9-A3-Cxx-b31P5i		FC	DC/DC	PECL	SMF 31dB	5V	-40~85°C
F1X9-AM-Cxx-b31P		ST	DC/DC	LVPECL	SMF 31dB	3.3V	0~70°C
F1X9-AM-Cxx-b31Pi		ST	DC/DC	LVPECL	SMF 31dB	3.3V	-40~85°C
F1X9-AM-Cxx-b31P5		ST	DC/DC	PECL	SMF 31dB	5V	0~70°C
F1X9-AM-Cxx-b31P5i		ST	DC/DC	PECL	SMF 31dB	5V	-40~85°C

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