



125M / 155M 1X9-100EZ Transceiver

Duplex SC/FC/ST, 1550nm DFB, SMF 120KM, LVPECL / PECL Signal Detection

Part Number: F1X9-Ax-S15-A2P



Overview

F1X9-Ax-S15-A2P 1X9 SIP package style transceivers are compliant with the industrial standard specification. The high performance uncooled 1550nm DFB transmitter and high sensitivity PIN receiver provide superior performance for Fast Ethernet and SDH STM-1 / SONET OC-3 and applications up to SMF 120km optical links.

Applications

- 100BASE-EZX Ethernet
- SDH STM1 / SONET OC3

Features

- Compatible with 100BASE-ZX
- Compatible with SDH STM1 and SONET OC3
- Industry Standard 1x9 Footprint
- 1550nm DFB laser transmitter
- Duplex SC/ST/FC optical connector
- Single 3.3V, Single 5V or 3.3/5V Universal Power Supply
- DC-coupled Differential LVPECL inputs and outputs
- LVPECL / PECL Signal Detection Output
- Wave Solderable and Aqueous Washable
- Link distance 120km 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-S15-A2P)	V _{CC}	0	+4.5	V
Supply Voltage (F1X9-Ax-S15-A2P5)	V _{CC}	0	+6.0	V

Recommended Operating Conditions

Parameters	Symbol	Min.	Typ.	Max.	Unit
Case Operating Temp. (F1X9-Ax-S15-A2P)	T _{OP}	0	-	+70	°C
Case Operating Temp. (F1X9-Ax-S15-A2Pi)	T _{OP}	-40	-	+85	°C
Supply Voltage (F1X9-Ax-S15-A2P)	V _{CC}	+3.13	+3.3	+3.47	V
Supply Voltage (F1X9-Ax-S15-A2P5)	V _{CC}	+4.75	+5.0	+5.25	V
Supply Current (F1X9-Ax-S15-A2P)	I _{CC}			270	mA
Supply Current (F1X9-Ax-S15-A2Pi)	I _{CC}			300	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-S15-A2P); T_{OP} = -40 °C to 85 °C (F1X9-Ax-S15-A2Pi)

Parameters	Symbol	Min.	Typ.	Max.	Unit	Note
Operating Data Rate	DR		125	155	Mb/s	
Optical Launch Power	P _o	0		+5	dBm	1
Optical Center Wavelength (0 °C to 70 °C)	λ _c	1530	1550	1570	nm	
Spectral Width (-20dB)	Δλ			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Optical Extinction Ratio	ER	10			dB	
Optical Eye Mask		IEEE802.3ah and ITU-T G.957				
Rise/Fall Time (10%~90%)	T _r / T _f		1	2	ns	
Relative Intensity Noise	RIN			-116	dB/Hz	
Differential Data Input Swing	V _{IN}	300		2400	mV	

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



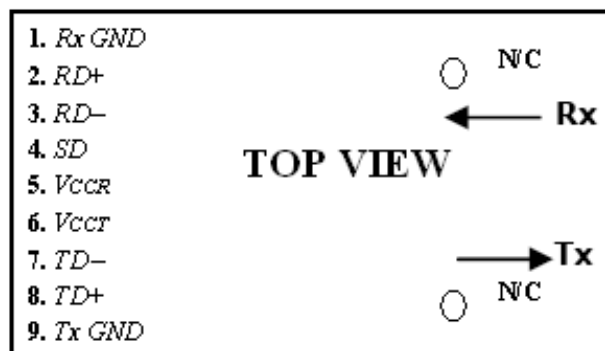
Receiver Electro-optical Characteristics

$T_{OP} = 0\text{ }^{\circ}\text{C to }70\text{ }^{\circ}\text{C}$ (F1X9-Ax-S15-A2P); $T_{OP} = -40\text{ }^{\circ}\text{C to }85\text{ }^{\circ}\text{C}$ (F1X9-Ax-S15-A2Pi)

Parameters	Symbol	Min.	Typ.	Max.	Unit	Note
Operating Data Rate	DR		125	155	Mb/s	
Receiver Sensitivity	SEN			-36	dBm	1
Maximum Receive Power	P _{Rx-MAX}	-3			dBm	1
Optical Center Wavelength	λ_c	1100		1610	nm	
Signal Detect Assert	SD _A			-36	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	
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

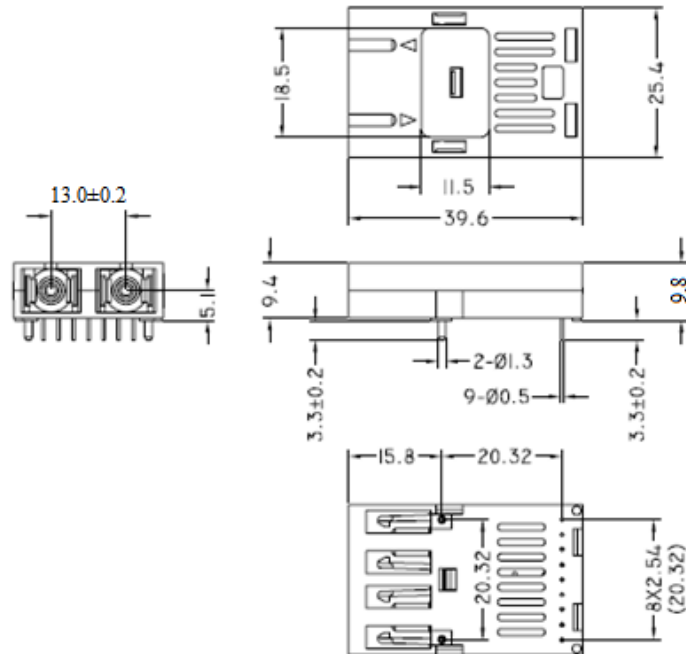
Pin	Name	Function / Description
1	Rx GND	Receiver Signal Ground
2	RD+	Receiver Data Out
3	RD-	Receiver Data Out Bar
4	SD	Signal Detect(1)
5	VccR	Receiver Power Supply
6	VccT	Transmitter Power Supply
7	TD-	Transmitter Data In Bar
8	TD+	Transmitter Data In
9	Tx GND	Transmitter Signal Ground

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).

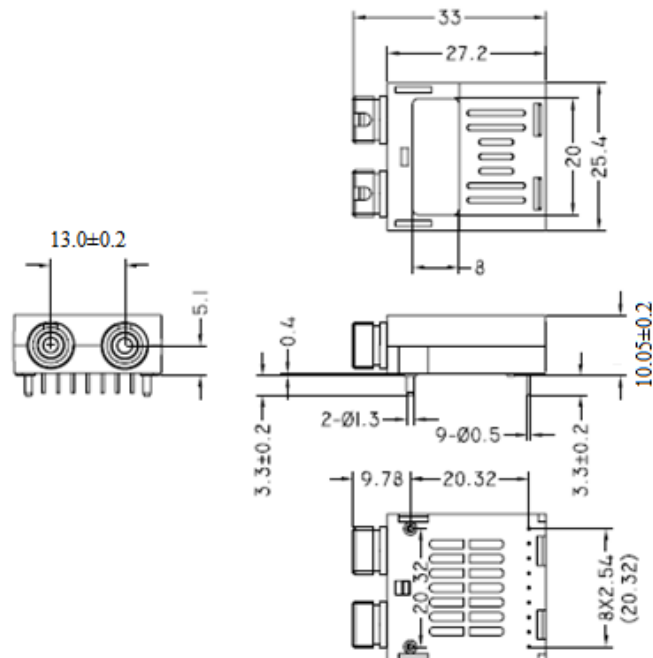


Mechanical Dimensions

(1) SC Connector Type

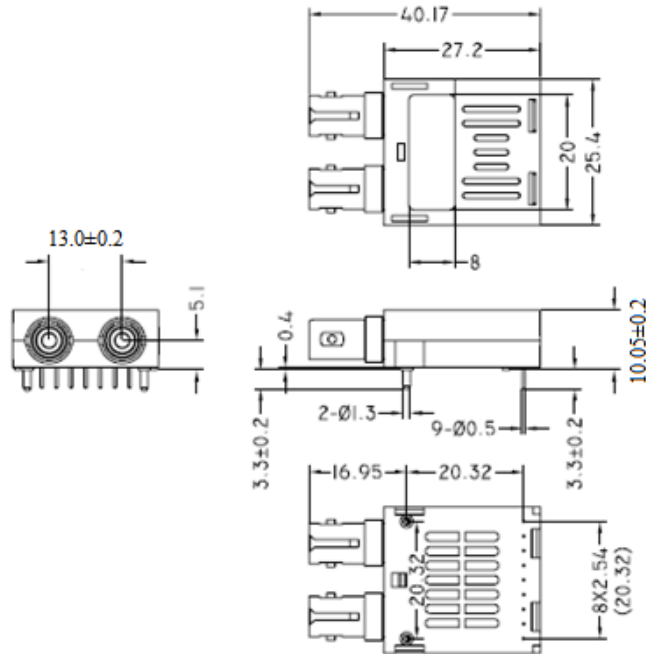


(2) FC Connector Type





(3) ST Connector Type





Ordering Information

Part No.	Tx	Conn.	I/O	SD	Link	Voltage	Temp.
F1X9-A1-S15-A2P	1550nm	SC	DC/DC	LVPECL	SMF 120km	3.3V	0~70°C
F1X9-A1-S15-A2Pi		SC	DC/DC	LVPECL		3.3V	-40~85°C
F1X9-A1-S15-A2P5		SC	DC/DC	PECL		5V	0~70°C
F1X9-A1-S15-A2P5i		SC	DC/DC	PECL		5V	-40~85°C
F1X9-A1-S15-A2P8		SC	DC/DC	LVPECL /PECL		3.3/5V	0~70°C
F1X9-A1-S15-A2P8i		SC	DC/DC			3.3/5V	-40~85°C
F1X9-A3-S15-A2P		FC	DC/DC	LVPECL		3.3V	0~70°C
F1X9-A3-S15-A2Pi		FC	DC/DC	LVPECL		3.3V	-40~85°C
F1X9-A3-S15-A2P5		FC	DC/DC	PECL		5V	0~70°C
F1X9-A3-S15-A2P8i		FC	DC/DC	PECL		5V	-40~85°C
F1X9-A3-S15-A2P8		FC	DC/DC	LVPECL /PECL		3.3/5V	0~70°C
F1X9-A3-S15-A2P5i		FC	DC/DC			3.3/5V	-40~85°C
F1X9-A5-S15-A2P		Plastic ST	DC/DC	LVPECL		3.3V	0~70°C
F1X9-A5-S15-A2Pi		Plastic ST	DC/DC	LVPECL		3.3V	-40~85°C
F1X9-A5-S15-A2P5		Plastic ST	DC/DC	PECL		5V	0~70°C
F1X9-A5-S15-A2P5i		Plastic ST	DC/DC	PECL		5V	-40~85°C
F1X9-A5-S15-A2P8		Plastic ST	DC/DC	LVPECL /PECL		3.3/5V	0~70°C
F1X9-A5-S15-A2P8i		Plastic ST	DC/DC			3.3/5V	-40~85°C
F1X9-AM-S15-A2P		Metal ST	DC/DC	LVPECL		3.3V	0~70°C
F1X9-AM-S15-A2Pi		Metal ST	DC/DC	LVPECL		3.3V	-40~85°C
F1X9-AM-S15-A2P5		Metal ST	DC/DC	PECL		5V	0~70°C
F1X9-AM-S15-A2P5i		Metal ST	DC/DC	PECL		5V	-40~85°C
F1X9-AM-S15-A2P8		Metal ST	DC/DC	LVPECL /PECL		3.3/5V	0~70°C
F1X9-AM-S15-A2P8i		Metal ST	DC/DC			3.3/5V	-40~85°C