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125M / 155M 1X9-100BX-U Transceiver
BiDi SC, Tx1490nm DFB / Rx1550nm, SMF 120KM, LVPECL / PECL Signal Detection

Part Number: F1X9-A2-S45-A2P

Overview

F1X9-A2-S45-A2P 1X9 SIP package style transceivers are compliant with the industrial standard specification. The high performance uncooled 1490nm DFB transmitter and high sensitivity PIN receiver provide superior performance for SDH STM-1 / SONET OC-3 and Fast Ethernet applications up to SMF 120km optical links.

Applications

- Fast Ethernet 100BASE-BX10 @125M
- SDH STM-1 / SONET OC-3 @155M

Features

- Compatible with IEEE802.3ah 100BASE-BX10
- Compatible with SDH STM-1 L1.2 and SONET OC-3 VR-1
- Industry Standard 1x9 Footprint
- 1490nm DFB laser transmitter
- Simplex BiDi 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 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.

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Absolute Maximum Ratings

Parameters	Symbol	Min.	Max.	Unit
Storage Temperature	T_{ST}	-40	+85	°C
Storage Relative Humidity	RH	5	95	%
Supply Voltage (F1X9-A2-S45-A2P)	V_{CC}	0	+4.5	V
Supply Voltage (F1X9-A2-S45-A2P5)	V_{CC}	0	+6.0	V

Recommended Operating Conditions

Parameters	Symbol	Min.	Typ.	Max.	Unit
Case Operating Temp. (F1X9-A2-S45-A2P)	T_{OP}	0	-	+70	°C
Case Operating Temp. (F1X9-A2-S45-A2Pi)		-40		+85	°C
Supply Voltage (F1X9-A2-S45-A2P)	V_{CC}	+3.13	+3.3	+3.47	V
Supply Voltage (F1X9-A2-S45-A2P5)	V_{CC}	+4.75	+5.0	+5.25	V
Supply Current	I_{CC}			300	mA
Lead Soldering Limits	Tsold			260/10	°C/Sec

Transmitter Electro-optical Characteristics

T_{OP} = 0 °C to 70 °C (F1X9-A2-S45-A2P); **T_{OP} = -40 °C to 85 °C** (F1X9-A2-S45-A2Pi)

Parameters	Symbol	Min.	Typ.	Max.	Unit	Note
Operating Data Rate	DR		125	155	Mb/s	
Optical Launch Power	Po	+2		+7	dBm	1
Optical Center Wavelength	λc	1470	1490	1510	nm	
Spectral Width (-20dB)	Δλ			1	nm	
Optical Extinction Ratio	ER	9			dB	
Optical Eye Mask		IEEE802.3ah and ITU-T G.957				
Rise/Fall Time	Tr/Tf			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 °C to 70 °C (F1X9-A2-S45-A2P); **T_{OP} = -40 °C to 85 °C** (F1X9-A2-S45-A2Pi)

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	1500		1580	nm	
Signal Detect De-Assert	SD_D			-35	dBm	
Signal Detect Assert	SD_A	-45			dBm	
Signal Detect Hysteresis	SD_{HY}	0.5		5	dB	
Differential Data Output Swing	V_{OUT}	300		2000	mV	
Signal Detect O/P Voltage Low	V_{SDL}-V_{CC}	-1810		-1620	mV	
Signal Detect O/P Voltage High	V_{SDH}-V_{CC}	-1025		-880	mV	

Note1: Measured with a PRBS 2^{23}-1 test pattern @155Mbps BER<10^{-12}.

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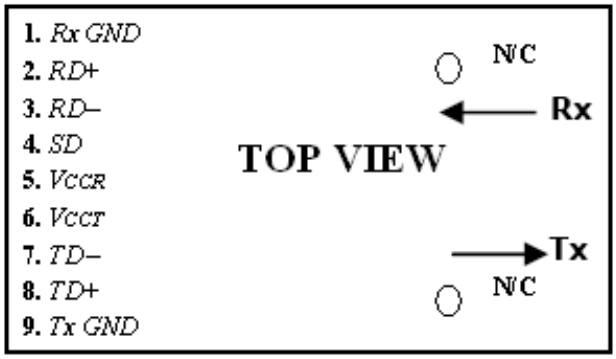
Pin Assignment



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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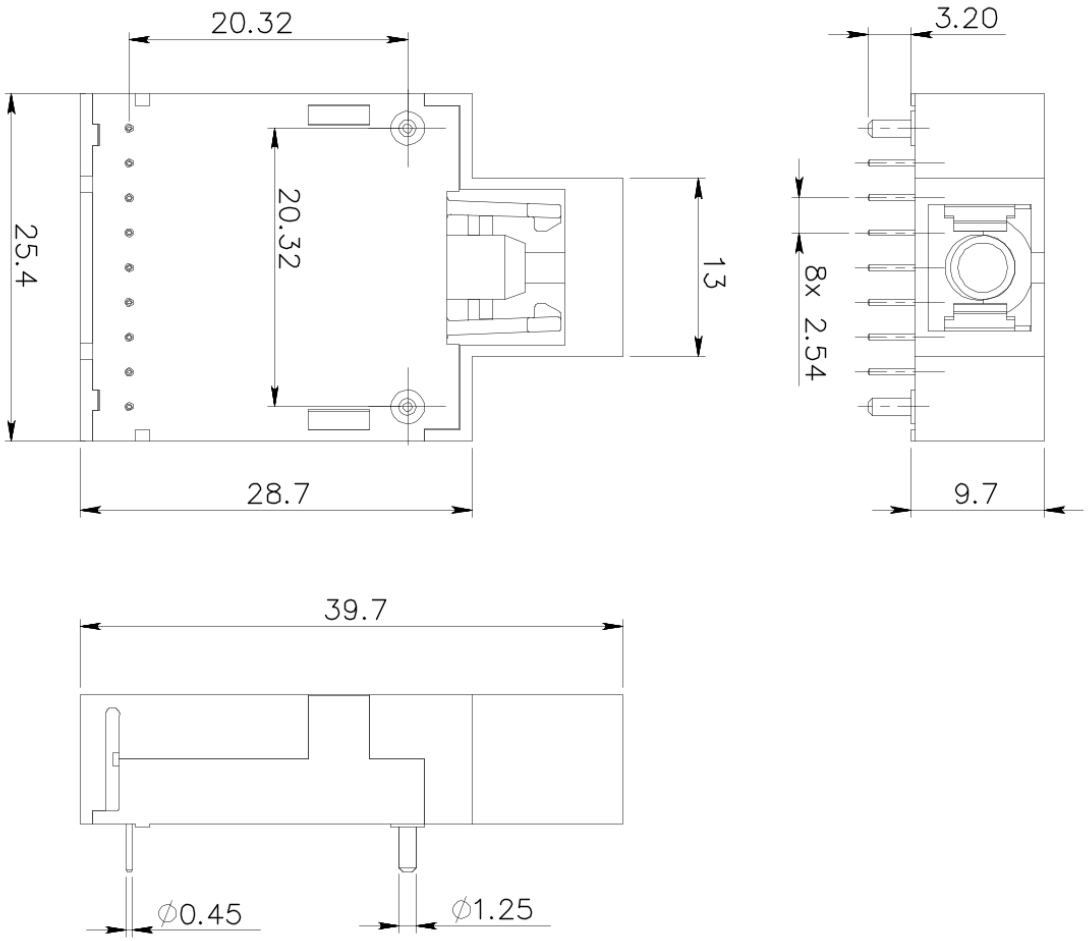
Mechanical Dimensions



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

Ordering Information

Part No.	Tx	Rx	Conn.	I/O	SD	Link	Voltage	Temp.
F1X9-A2-S45-A2P	1490nm	1500nm ~ 1580nm	BiDi SC	DC/DC	LVPECL	SMF 120km	3.3V	0~70°C
F1X9-A2-S45-A2Pi					LVPECL		3.3V	-40~85°C
F1X9-A2-S45-A2P5					PECL		5V	0~70°C
F1X9-A2-S45-A2P5i					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.

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