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125M / 155M 1X9-100BX-D Transceiver
BiDi SC, Tx1550nm FP / Rx1310nm, SMF 20KM, LVTTL / TTL Signal Detection

Part Number: F1X9-A2-S53-20B

Overview

F1X9-A2-S53-20B 1X9 SIP package style transceivers are compliant with the industrial standard specification. The high performance uncooled 1550nm FP transmitter and high sensitivity PIN receiver provide superior performance for Fast Ethernet and SONET OC-3 / SDH STM-1 applications up to SMF 20km optical links.

Applications

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

Features

- Compliant with IEEE802.3ah 100BASE-LX10
- Compliant with SONET OC-3 IR-1 and SDH STM-1 S1.1
- Industry Standard 1x9 Footprint
- 1550nm FP transmitter & 1310nm PIN receiver
- Simplex BiDi SC connector
- Single 3.3V or 5V Power Supply
- DC-coupled Differential LVPECL inputs and outputs
- LVTTL / TTL 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.

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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-S53-20B)	V_{CC}	0	+4.5	V
Supply Voltage (F1X9-A2-S53-20B5)	V_{CC}	0	+6.0	V

Recommended Operating Conditions

Parameters	Symbol	Min.	Typ.	Max.	Unit
Case Operating Temp. (F1X9-A2-S53-20B)	T_{OP}	0	-	+70	°C
Case Operating Temp. (F1X9-A2-S53-20Bi)		-40		+85	°C
Supply Voltage (F1X9-A2-S53-20B)	V_{CC}	+3.13	+3.3	+3.47	V
Supply Voltage (F1X9-A2-S53-20B5)	V_{CC}	+4.75	+5.0	+5.25	V
Supply Current	I_{CC}			300	mA
Power Consumption	P			1	W
Lead Soldering Limits	Tsold			260/10	°C/Sec

Transmitter Electro-optical Characteristics

T_{OP} = 0 °C to 70 °C (F1X9-A2-S53-20B); **T_{OP} = -40 °C to 85 °C** (F1X9-A2-S53-20Bi)

Parameters	Symbol	Min.	Typ.	Max.	Unit	Note
Operating Data Rate	DR	50	125/155	200	Mb/s	
Optical Launch Power	Po	-14		-8	dBm	1
Optical Center Wavelength	λc	1510	1550	1570	nm	
Spectral Width (RMS)	Δλ			4	nm	
Optical Extinction Ratio	ER	9			dB	
Optical Eye Mask		IEEE802.3ah and ITU-T G.957				
Rise/Fall Time	Tr/Tf			2	ns	
Differential Data Input Swing	V_{IN}	400		2000	mV	

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

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Receiver Electro-optical Characteristics

T_{OP} = 0 °C to 70 °C (F1X9-A2-S53-20B); **T_{OP} = -40 °C to 85 °C** (F1X9-A2-S53-20Bi)

Parameters	Symbol	Min.	Typ.	Max.	Unit	Note
Operating Data Rate	DR	50	125/155	200	Mb/s	
Receiver Sensitivity	SEN			-32	dBm	1
Maximum Receive Power	P_{Rx-MAX}	-3			dBm	1
Optical Center Wavelength	λc	1280		1340	nm	
Signal Detect De-Assert	SD_D			-32	dBm	
Signal Detect Assert	SD_A	-46			dBm	
Signal Detect Hysteresis	SD_{HY}	0.5			dB	
Differential Data Output Swing	V_{OUT}	500		1200	mV	
Signal Detect O/P Voltage Low	V_{SDL}	GND		0.4	V	
Signal Detect O/P Voltage High	V_{SDH}	V_{CC}-0.4		V_{CC}	V	

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

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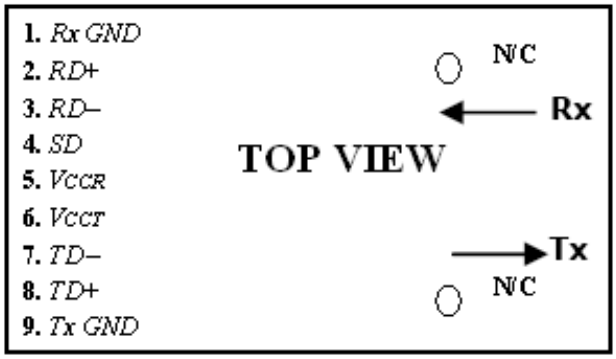
Pin Assignment



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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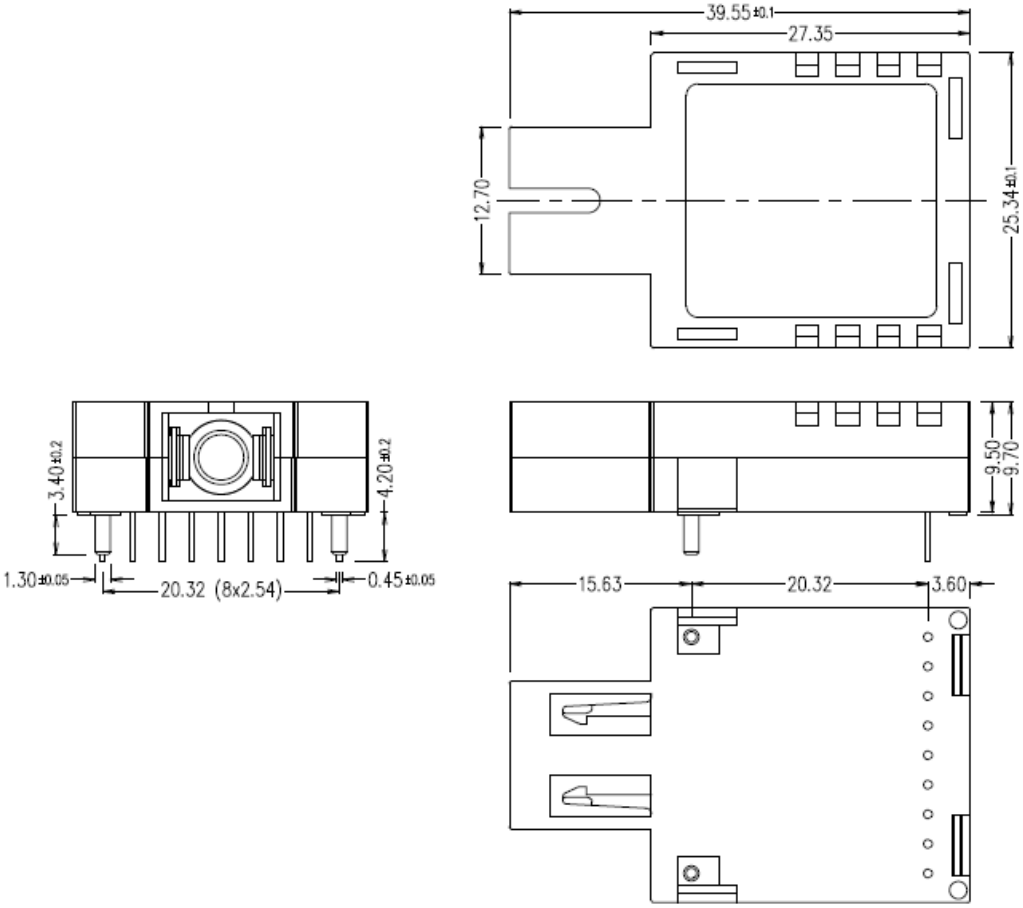
Mechanical Dimensions



(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-S53-20B	1550nm	1280nm ~ 1340nm	BiDi SC	DC/DC	LVTTL	SMF 20km	3.3V	0~70°C
F1X9-A2-S53-20Bi					LVTTL		3.3V	-40~85°C
F1X9-A2-S53-20B5					TTL		5V	0~70°C
F1X9-A2-S53-20B5i					TTL		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.