



125M / 155M 1X9-100SX Transceiver

Duplex Plastic ST, 850nm VCSEL, MMF 2KM, LVPECL / PECL Signal Detection

Part Number: F1X9-A5-M85-02P



Overview

F1X9-A5-M85-02P 1X9 SIP package style transceivers are compliant with the industrial standard specification. The high performance uncooled 850nm VCSEL transmitter and high sensitivity PIN receiver provide superior performance for SDH STM-1 / SONET OC-3 and Fast Ethernet applications up to MMF 2km optical links.

Applications

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

Features

- Compatible with TIA/EIA-785 100BASE-SX
- Industry Standard 1x9 Footprint
- 850nm VCSEL laser transmitter
- Duplex Plastic ST 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 2km over MM 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-A5-M85-02P)	V _{CC}	0	+4.5	V
Supply Voltage (F1X9-A5-M85-02P5)	V _{CC}	0	+6.0	V

Recommended Operating Conditions

Parameters	Symbol	Min.	Typ.	Max.	Unit
Case Operating Temp. (F1X9-A5-M85-02P)	T _{OP}	0	-	+70	°C
Case Operating Temp. (F1X9-A5-M85-02Pi)	T _{OP}	-40	-	+85	°C
Supply Voltage (F1X9-A5-M85-02P)	V _{CC}	+3.13	+3.3	+3.47	V
Supply Voltage (F1X9-A5-M85-02P5)	V _{CC}	+4.75	+5.0	+5.25	V
Supply Current (F1X9-A5-M85-02P)	I _{CC}			270	mA
Supply Current (F1X9-A5-M85-02Pi)	I _{CC}			300	mA
Lead Soldering Limits	T _{sold}			260/10	°C/Sec

Transmitter Electro-optical Characteristics

T_{OP} = 0 °C to 70 °C (F1X9-A5-M85-02P); T_{OP} = -40 °C to 85 °C (F1X9-A5-M85-02Pi)

Parameters	Symbol	Min.	Typ.	Max.	Unit	Note
Operating Data Rate	DR		125	155	Mb/s	
Optical Launch Power	P _o	-10		-3	dBm	1
Optical Center Wavelength	λ _c	830	850	870	nm	
Spectral Width (RMS)	Δλ			0.85	nm	
Optical Extinction Ratio	ER	8.2			dB	
Optical Eye Mask		IEEE802.3u, ITU-T G.957 and TIA/EIA-785				
Optical Rise/Fall Time (20%~80%)	T _r / T _f			2	ns	
Differential Data Input Swing	V _{IN}	400		2000	mV	

Note1: The optical power is launched into a 62.5/125μm multi-mode fiber.



Receiver Electro-optical Characteristics

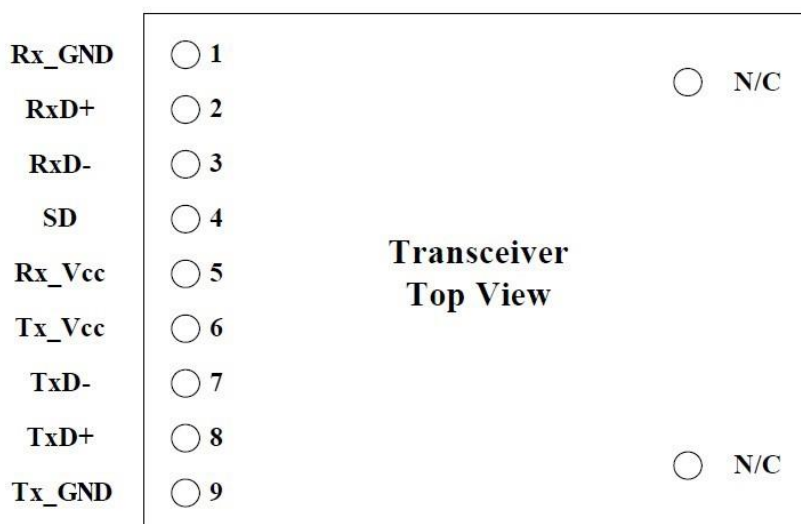
$T_{OP} = 0^{\circ}C$ to $70^{\circ}C$ (F1X9-A5-M85-02P); $T_{OP} = -40^{\circ}C$ to $85^{\circ}C$ (F1X9-A5-M85-02Pi)

Parameters	Symbol	Min.	Typ.	Max.	Unit	Note
Operating Data Rate	DR		125	155	Mb/s	
Receiver Sensitivity	SEN			-26	dBm	1
Maximum Receive Power	P _{Rx-MAX}	-3			dBm	1
Optical Center Wavelength	λ_c	770		870	nm	
Data Output Rise/Fall Time (20%~80%)	T _r / T _f			2	ns	
Signal Detect Assert	SD _D			-26	dBm	
Signal Detect De-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-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

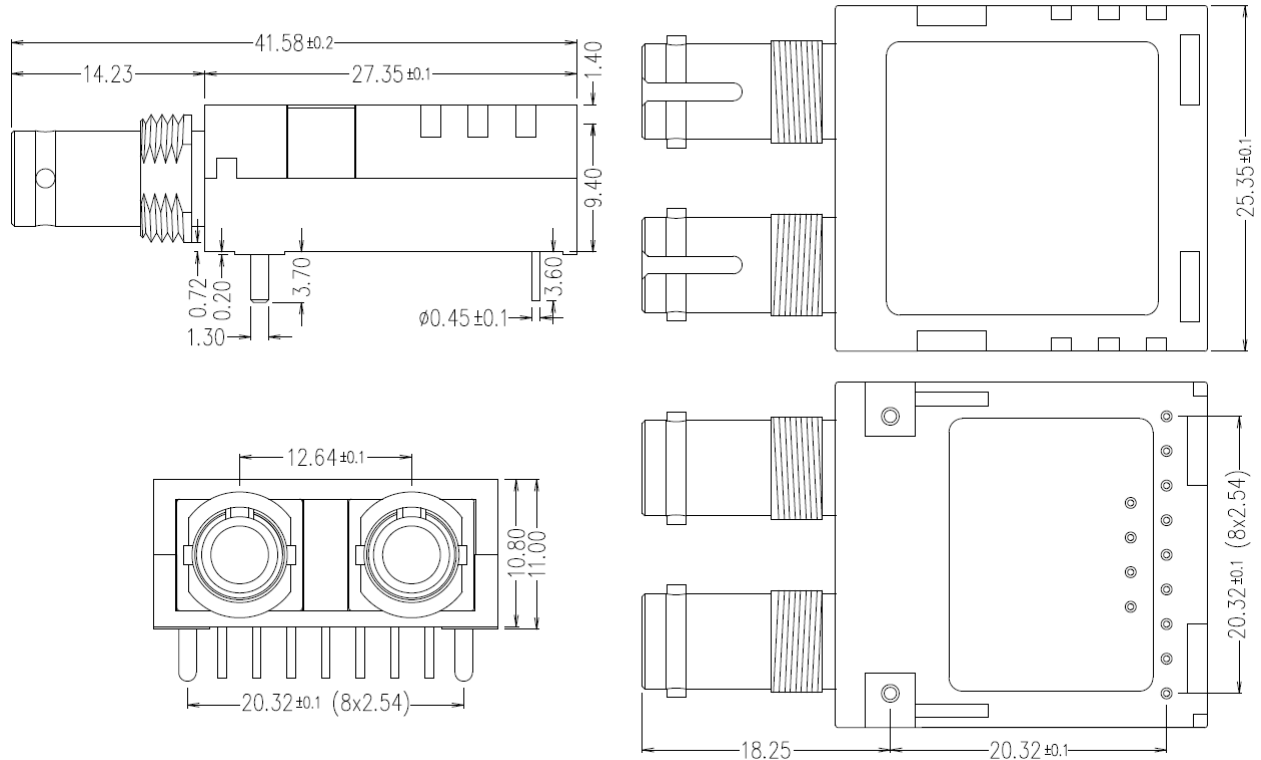


Pin Description

Pin	Name	Function / Description
1	Rx_GND	Receiver Signal Ground
2	RxD+	Receiver Non-inverted Data Out
3	RxD-	Receiver Inverted Data Out
4	SD	Signal Detect is used to open collector output with PECL/LVPECL level Normal optical input levels to the receiver result in a logic "1" output
5	Rx_Vcc	Receiver Power Supply
6	Tx_Vcc	Transmitter Power Supply
7	TxD-	Transmitter Inverted Data In
8	TxD+	Transmitter Non-inverted Data In
9	Tx_GND	Transmitter Signal Ground



Mechanical Dimensions



(All Dimensions are $\pm 0.20\text{mm}$ Unless Otherwise Specified, Unit: mm)

Ordering Information

Part No.	Tx	Rx	Conn.	I/O	SD	Link	Voltage	Temp.
F1X9-A5-M85-02P	850nm	770nm ~ 870nm	ST	DC/DC	LVPECL	2km	3.3V	0~70°C
F1X9-A5-M85-02Pi					LVPECL		3.3V	-40~85°C
F1X9-A5-M85-02P5					PECL		5V	0~70°C
F1X9-A5-M85-02P5i					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.