

# AXCEN

PHOTONICS CORPORATION

## AXFE-1311-013x 125Mbps Single-mode 1310nm, 10km, 1x9 DSC Transceiver



### Product Overview

The AXFE-1311-013x transceivers are specifically designed for the high performance integrated duplex data link over single-mode optical fiber. These transceiver modules are compliant with the DSC Multisource Agreement (MSA). These modules are designed to provide 100Base-LX10 compliant in Fast Ethernet applications.

The AXFE-1311-013x transceivers using a long wavelength (1310nm) light source enable data transmission up to 10km on a single-mode (9/125 $\mu$ m) optical fiber.

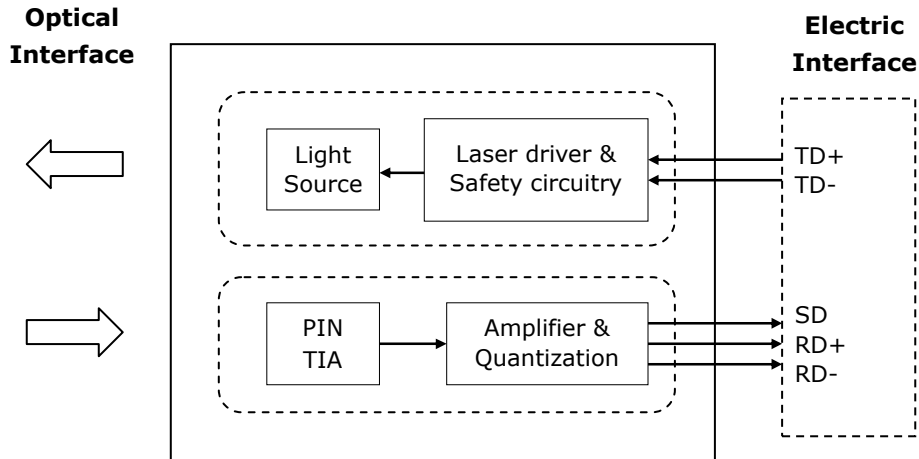
### Features

- **Low Profile (9.8mm maximum) plastic molded package**
- **125Mbps IEEE802.3ah 100BASE-LX10 compliant**
- **Single +3.3~5V power supply operation**
- **DC coupled PECL level inputs and outputs**
- **PECL signal detect output**
- **Class 1 laser safety standard IEC 60825 compliant**
- **10 km link on a single-mode fiber**
- **Low power dissipation**

### Applications

- **Fast Ethernet**
- **FDDI**

**Block diagram**



**Absolute Maximum Ratings**

Parameter	Symbol	Min.	Max.	Unit	Note
Storage Temperature	$T_S$	-40	+85	°C	
Supply Voltage	$V_{CCT}$ $V_{CCR}$	-0.5	+6.0	V	
Storage Relative Humidity	RH	5	95	%	
Lead Soldering Temperature	$T_{Is}$		260	°C	
Lead Soldering Time	$t_{Is}$		10	sec	

**Recommended Operating Conditions**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Case Operating Temperature	$T_C$	0		70	°C	Refer to ordering information
		-40		85		
Supply Voltage	$V_{CC}$	3.1	3.3	3.5	V	
		4.75	5.0	5.25		
Supply Current	$I_{TX} + I_{RX}$		150	300	mA	



### Transmitter Electro-Optical Interface

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Data Input Voltage – Low	$V_L-V_{CC}$	-1.81		-1.475	V	
Data Input Voltage - High	$V_H-V_{CC}$	-1.165		-0.880	V	
Optical Output Power	$P_O$	-15		-8	dBm	
Optical Extinction Ratio	$E_R$	5			dB	
Center Wavelength	$\lambda_C$	1260		1360	nm	
Spectral Width (RMS)	$\Delta\lambda$			7.7	nm	
Optical Rise Time	$t_r$			2.0	ns	1
Optical Fall Time	$t_f$			2.0	ns	1

**Notes:**

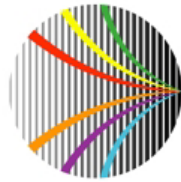
1. 10% to 90% value

### Receiver Electro-Optical Characteristics

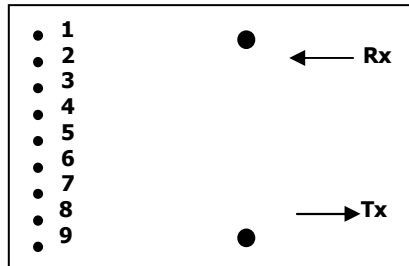
Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Receiver Overload	$P_{INMAX}$	-8			dBm	1
Receiver Sensitivity	$P_{INMIN}$			-25	dBm	1
Operating Center Wavelength	$\lambda_C$	1260		1360	nm	
Receiver Signal Detect – High	$P_{SDA}$			-25	dBm	
Receiver Signal Detect – Low	$P_{SDD}$	-45			dBm	
Receiver Signal Detect - Hysteresis	$P_{SDH}$	0.5			dB	
Receiver Signal Detect Voltage - Low	$V_{SDL}-V_{CC}$	-2		-1.58	V	
Receiver Signal Detect Voltage - High	$V_{SDH}-V_{CC}$	-1.1		-0.74	V	

**Notes:**

1. With BER better than or equal to  $1 \times 10^{-12}$ , measured in the center of the eye opening with  $2^7 - 1$  PRBS



## Pin Description

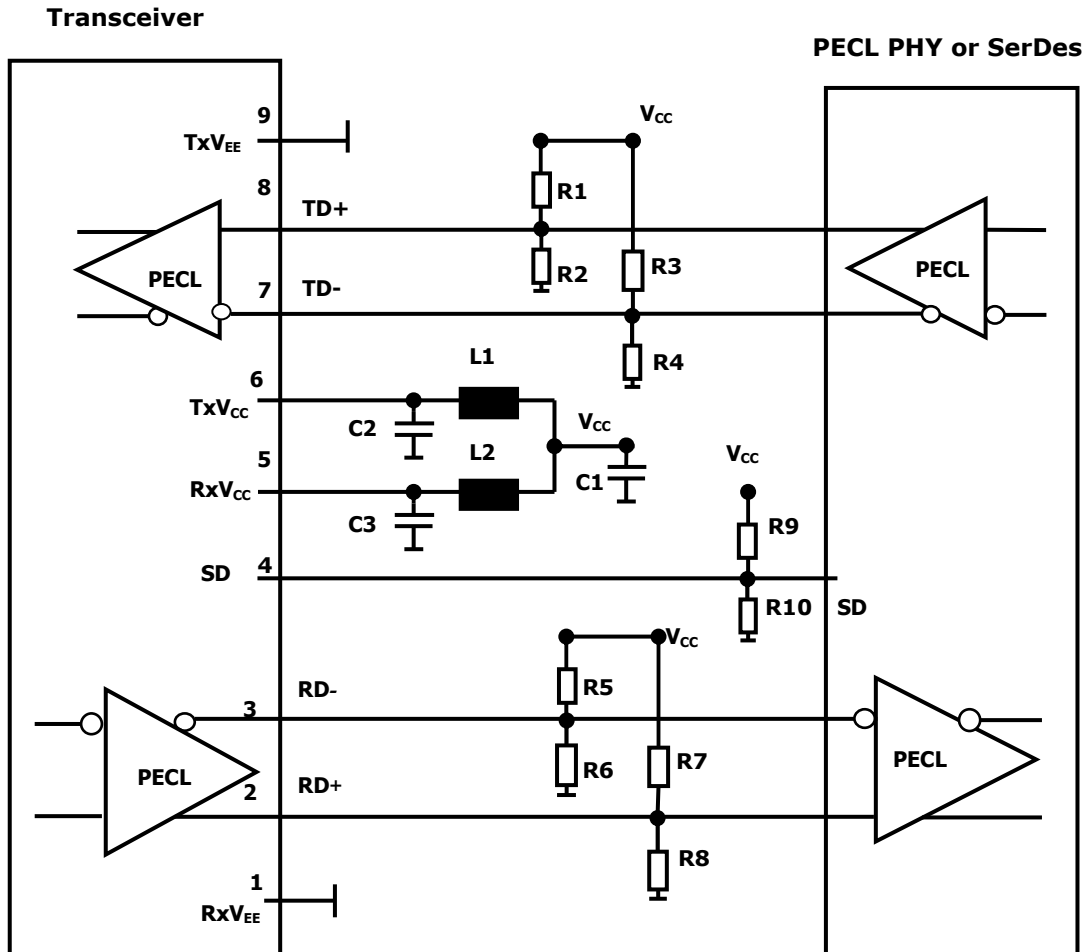


**Top View**

Pin No	Pin Name	Function	Notes
1	RxV <sub>EE</sub>	Receiver signal ground	
2	RD+	Receiver data out	
3	RD-	Receiver data out bar	
4	SD	Signal detect	
5	RxV <sub>CC</sub>	Receiver power supply	
6	TxV <sub>CC</sub>	Transmitter power supply	
7	TD-	Transmitter data in bar	
8	TD+	Transmitter data in	
9	TxV <sub>EE</sub>	Transmitter signal ground	

## Recommended Interface Circuit

### TX DC Coupling / RX DC Coupling, PECL Signal Detect



**Notes:**

**R1/R3/R5/R7/R9=130 ohm (3.3V) or depends on SerDes chip used.**

**=82 ohm (5V) or depends on SerDes chip used.**

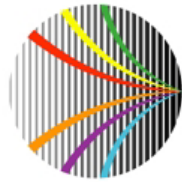
**R2/R4/R6/R8/R10=82 ohm (3.3V) or depends on SerDes chip used.**

**=130 ohm (5V) or depends on SerDes chip used.**

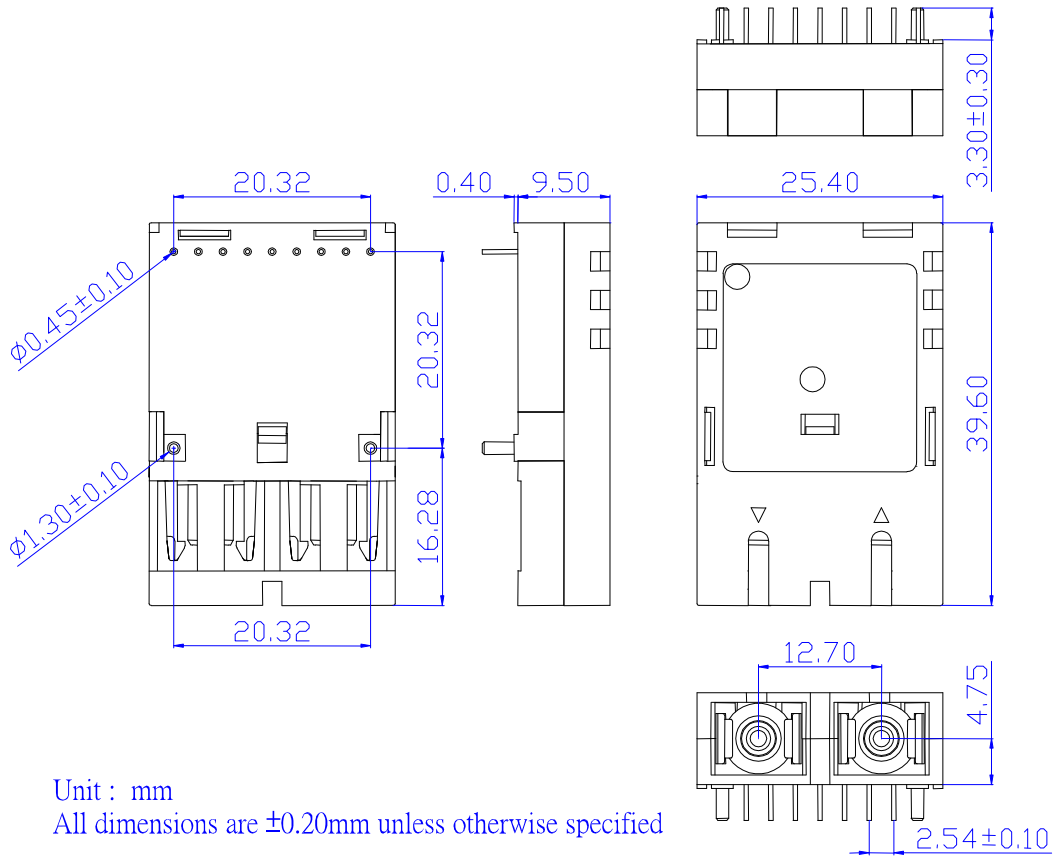
**C1=10uF**

**C2/C3=0.1uF**

**L1/L2=1uH**



## Mechanical Dimensions (Units in mm)



## Ordering Information

### AXFE-1311-013x



#### Operating Temperature

- 6: 0~70°C
- 7: -40~85°C

Model No.	Wavelength	LD	I/O	SD	Link	Temp.
AXFE-1311-0136	1310nm	FP	DC/DC	PECL	10km	0~70°C
AXFE-1311-0137	1310nm	FP	DC/DC	PECL	10km	-40~85°C