

# AXCEN

PHOTONICS CORPORATION

## **AXGE-5851 1.25Gbps Multimode 850nm, 1x9 ST Transceiver**



### **Product Overview**

The AXGE-5851 family of 1x9 ST transceiver modules is specifically designed for the high performance integrated duplex data link over multimode optical fiber. These transceiver modules are compliant with the ST Multisource Agreement (MSA). These modules are designed to provide 1000Base-SX compliant in Gigabit Ethernet applications.

The AXGE-5851 transceivers using a short wavelength (850nm) VCSEL laser diode enable data transmission up to 550m on a multimode 50/125 $\mu$ m optical fiber and 300m on a multimode 62.5/125 $\mu$ m optical fiber.

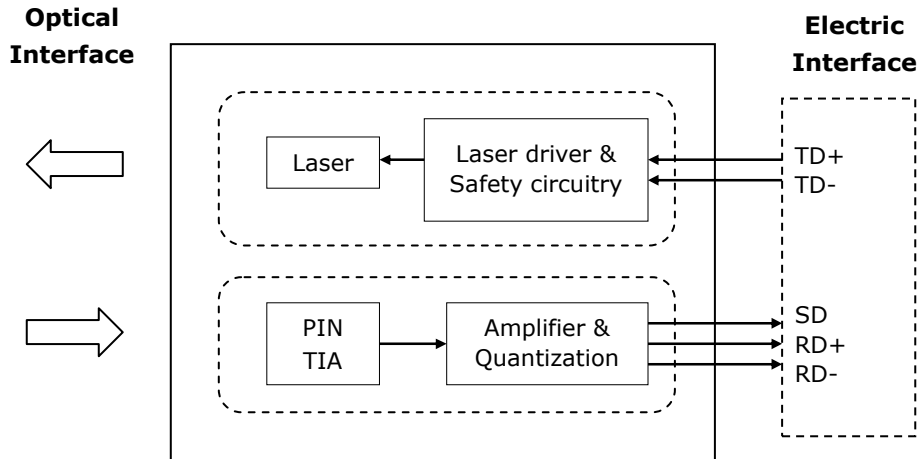
### **Features**

- **Duplex ST receptacle**
- **1.0625Gbps Fibre Channel FC-PI 100-M5-SN-I compliant**
- **1.0625Gbps Fibre Channel FC-PI 100-M6-SN-I compliant**
- **1.25Gbps IEEE 802.3z 1000BASE-SX compliant**
- **1.25Gbps IEEE 802.3ah 1000BASE-SX compliant**
- **Single +3.3V power supply operation**
- **DC or AC coupling PECL level inputs and outputs**
- **PECL or TTL signal detect output**
- **Class 1 laser safety standard IEC 60825 compliant**
- **Low power dissipation**

### **Applications**

- **1xFibre Channel**
- **Gigabit Ethernet**
- **High speed I/O for file server**

### 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	4.0	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
		-20		85		
		-40		85		
Supply Voltage	$V_{CC}$	3.1	3.3	3.5	V	
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	$P_O$	-9.5		-4	dBm	1
Optical Extinction Ratio	$E_R$	9			dB	
Center Wavelength	$\lambda_C$	830	850	860	nm	
Spectral Width (RMS)	$\Delta\lambda$			0.85	nm	
Optical Rise / Fall Time	$t_r / t_f$			260	ps	2
Relative Intensity Noise	RIN			-117	dB/Hz	
Total Contributed Jitter	TJ			227	ps	

### Notes:

1. Coupling into a 50/125 $\mu$ m multimode fiber.
2. 20% to 80% value

## Receiver Electro-Optical Characteristics

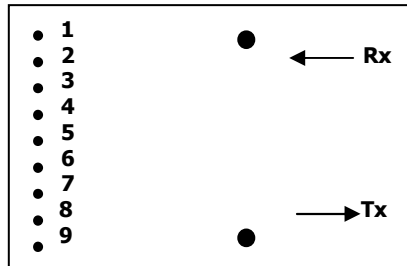
Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Receiver Overload	$P_{INMAX}$	-3			dBm	1
Receiver Sensitivity	$P_{INMIN}$			-17	dBm	1
Operating Center Wavelength	$\lambda_C$	770		860	nm	
Receiver Signal Detect – High	$P_{RX\_SDA}$			-17.5	dBm	
Receiver Signal Detect – Low	$P_{RX\_SDD}$	-35			dBm	
Receiver Signal Detect - Hysteresis	$P_{RX\_SDH}$	0.5			dB	

### 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

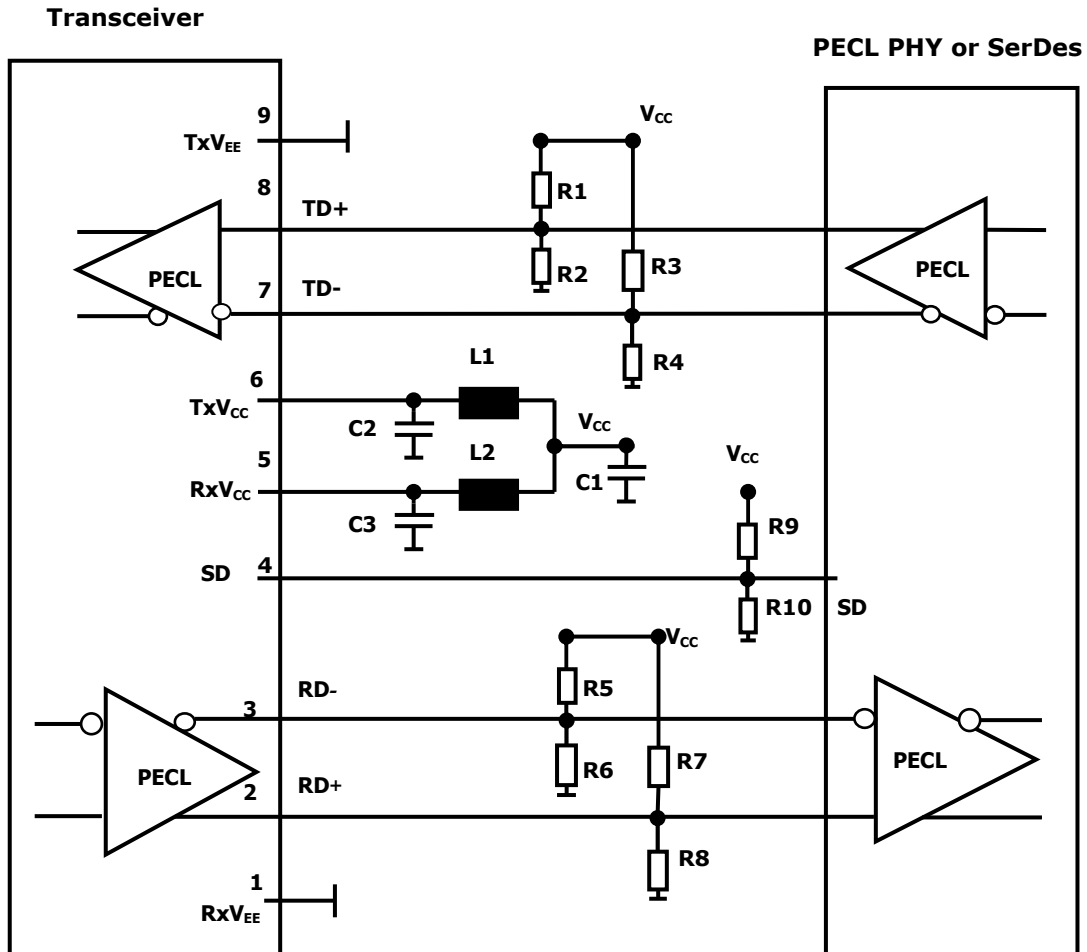


**Top View**

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 (Depends on SerDes chip used.)**

**=82 ohm @5V (Depends on SerDes chip used.)**

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

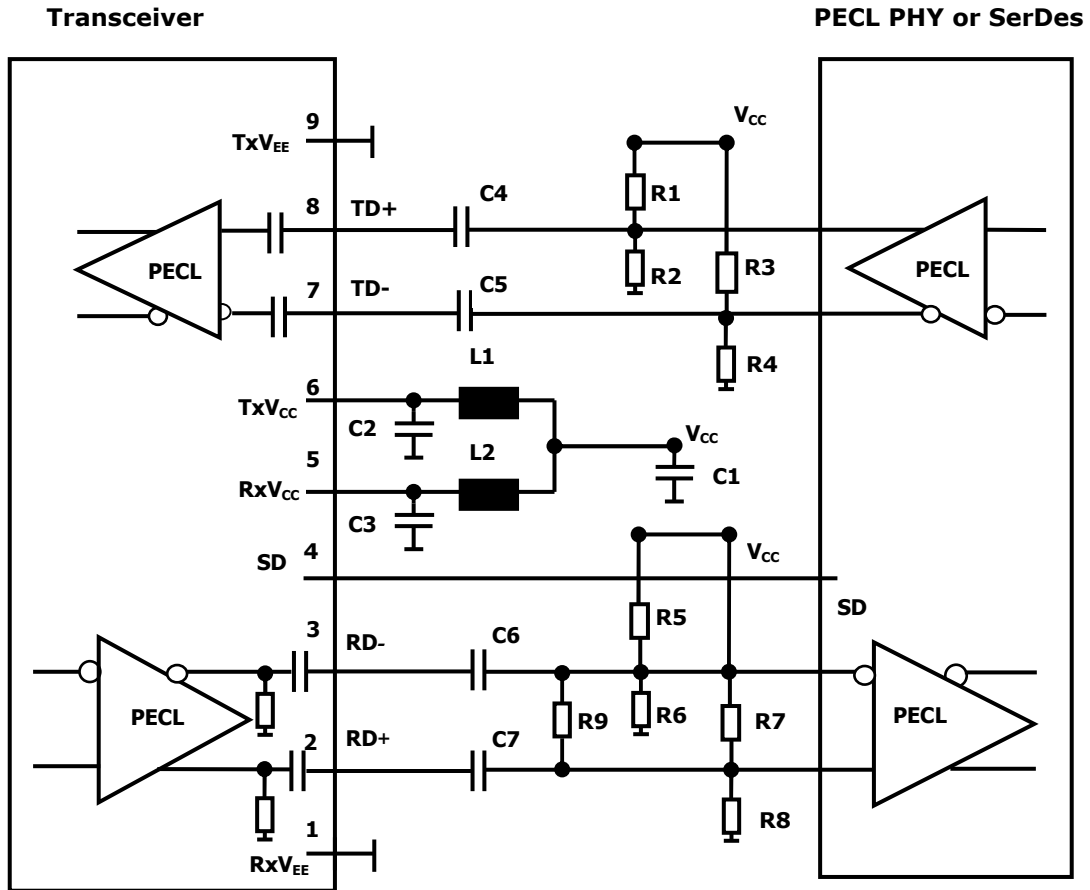
**=130 ohm @5V (Depends on SerDes chip used.)**

**C1=10uF**

**C2/C3=0.1uF**

**L1=L2=1uH**

## TX AC Coupling / RX AC Coupling, TTL Signal Detect



**Notes:**

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

**=82 ohm @5V (Depends on SerDes chip used.)**

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

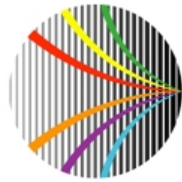
**=130 ohm@5V (Depends on SerDes chip used.)**

**R9 =100 ohm (Depends on SerDes chip used.)**

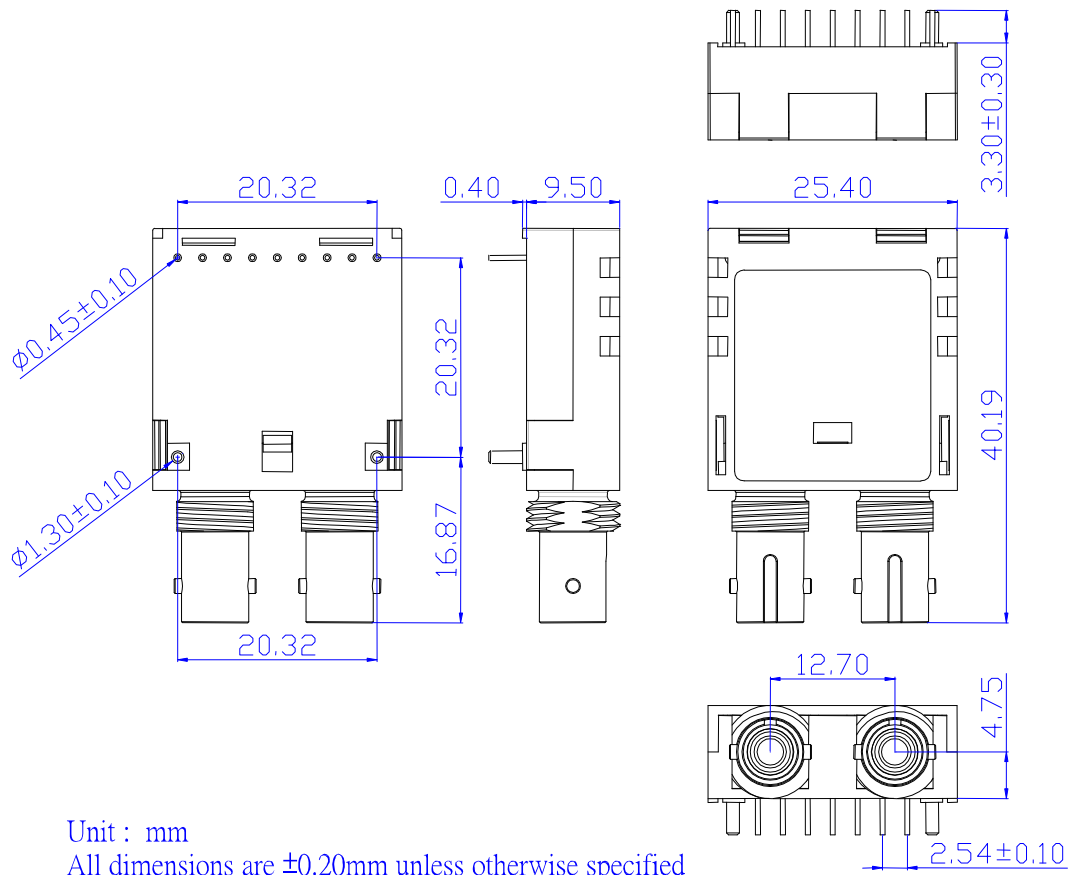
**C1=10uF**

**C2/C3/C4/C5/C6/C7=0.1uF**

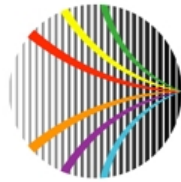
**L1=L2=1uH**



## Mechanical Dimensions (Units in mm)

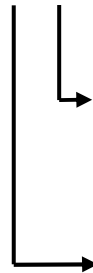


Unit : mm  
All dimensions are  $\pm 0.20$ mm unless otherwise specified



## Ordering Information

### AXGE-5851-0x1y



#### Operating temperature

- 1: 0~70°C
- 2: -20~85°C
- 3: -40~85°C

#### I/O Interface

- K: TX DC coupling / RX DC coupling, PECL Signal Detect, with ST connector
- L: TX AC coupling / RX AC coupling, TTL Signal Detect, with ST connector

Model No.	Wavelength	LD	I/O	SD	Link	Temp.
AXGE-5851-0K11	850nm	VCSEL	DC/DC	PECL	550m	0~70°C
AXGE-5851-0K12	850nm	VCSEL	DC/DC	PECL	550m	-20~85°C
AXGE-5851-0K13	850nm	VCSEL	DC/DC	PECL	550m	-40~85°C
AXGE-5851-0L11	850nm	VCSEL	AC/AC	TTL	550m	0~70°C
AXGE-5851-0L12	850nm	VCSEL	AC/AC	TTL	550m	-20~85°C
AXGE-5851-0L13	850nm	VCSEL	AC/AC	TTL	550m	-40~85°C