ELECTRO-OPTIC DEVICES, INC.

ERX-5X

Low-Noise Si-PIN Photodiode Optical Receiver

FEATURES:

- Compatible with ERC-2A Laser ranging controller.
- Si-PIN detector, sensor area 1mm x 1mm square.
- Wideband -3dB bandwidth = 25 MHz. (standard).
- Noise equivalent power = 25nW (@850 nm).
- Gain = 500 kV/W (typical).
- Single power supply = 10 - 12 Vdc.
- Current consumption 70 mA (typical).
- Compact circuit board 2.000 x 1.125 inches.

DESCRIPTION:

The ERX-5x is a low-noise Si-PIN photodiode optical receiver with a 1mm x 1mm square sensor area. The ERX-5x has a wideband –3dB standard bandwidth of 25MHz, 25nW of noise equivalent power at 850nm and a gain of 500kV/W.

Requires a single 10-12V power supply. Typically consumes 70mA of current. Compact circuit board design with dimensions of 2.000 x 1.125 inches.

Interface:

Pin	Signal	Description
1	**Vcc**	10 – 12Vdc (70 mA typ.)
2	**GND**	Ground
3	**N.C.**	NO CONNECTION
4	**DCO**	Digital Comparator Output (TTL)
5	**GND**	Ground

Receiver Application:

The ERX-5X is a wideband receiver. As such, it is susceptible to outside interference and internal feedback of its digital output if the receiver is not shielded properly. To facilitate this, a narrow ground-plane perimeter is available on the component side of the circuit board. A thin copper, brass or tin shield should be soldered to this perimeter. The shield can be perforated to accommodate access to setting the receiver sensitivity via VR1.

The Si-PIN photodiode is an extremely noise / interference sensitive node. A metallic shield should surround the detector to which the receiver is attached via the two mounting holes. This metallic shield is typically a metal component machined to provide not only the shield properties but to facilitate optical alignment in the application's optical system.

CAUTION: beware of the "No Via" perimeter (0.98 inch diameter) for flush mount to metal assemblies (see illustration). No contact should be made to bottom side of PCB outside this perimeter.

Detector:

The photodiode detector shipped on the standard ERX-5X receiver is Siemens SFH203PFA. This diode is encapsulated in IR filter material with a typical peak responsitivity of 0.59 A/W at 900 nm. The sensor area is 1mm x 1mm square.

Sensitivity Adjustment:

VR1 adjusts the comparator threshold level (see illustration on page 1). Turning VR1 counter-clockwise increases the receiver sensitivity. When making adjustment, the receiver's digital output (pin 4) should be monitored on an oscilloscope to set an acceptable false alarm rate.

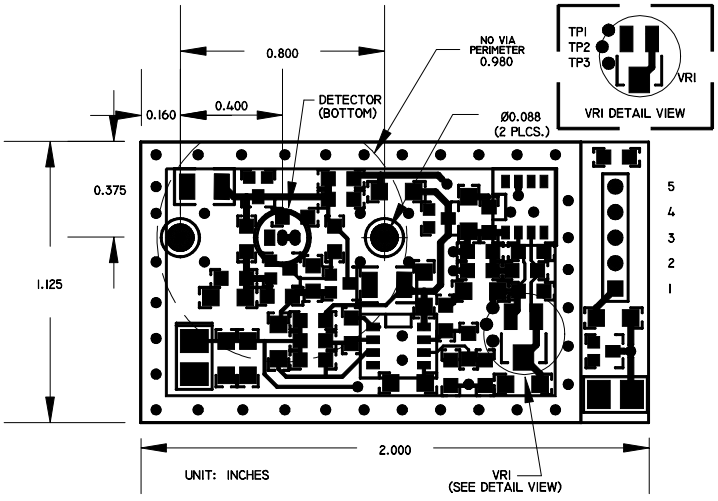
First adjust fully clockwise for least sensitivity. The digital output should be normally logic LOW. Slowly turn VR1 in the counter-clockwise direction to desired sensitivity. A shielded output connection and shielding for the detector may be necessary to avoid oscillation while setting sensitivity.

Test Points:

In the illustration on page 1, a detail view of VR1 indicates the positions of three test points. TP1 allows the analog signal from the post amplifier to be viewed (AC coupled). TP2 is a ground reference point. TP3 allows the comparator threshold level to be measured as set by VR1. To document the threshold setting, a high impedance DC voltmeter can measure the relative threshold voltage by placing the RED test lead at TP3 and the BLACK test lead at TP1. The threshold value should be positive in the range from 50mV to 850mV (typical).

Lower threshold values imply higher sensitivity as well as higher false alarms. False alarms are logic HI impulses on the receiver's digital output that correspond to comparator switching due to noise peaks crossing the threshold voltage level.

Structured or periodic output impulses that do not correspond with intended signal are likely due to radiated or conducted EMI being picked up by the receiver. To prevent this, adequate shielding and power supply filtering is required.



(specifications are subject to change)