

High Linearity Position Sensing Detector

Part Number: S1-0090

Description: 1L5NT_CP1

The SiTek 1L5NT PSD functions according to the Lateral Effect Photodiode principle. It is an analogue device and therefore displays excellent position resolution. The resolution is determined by the system signal-to-noise ratio. The 1L5NT has a unique build in straylight elimination. A patented design which eliminates the decrease in speed and linearity due to straylight.

The 1L5NT is operated in the biased mode.

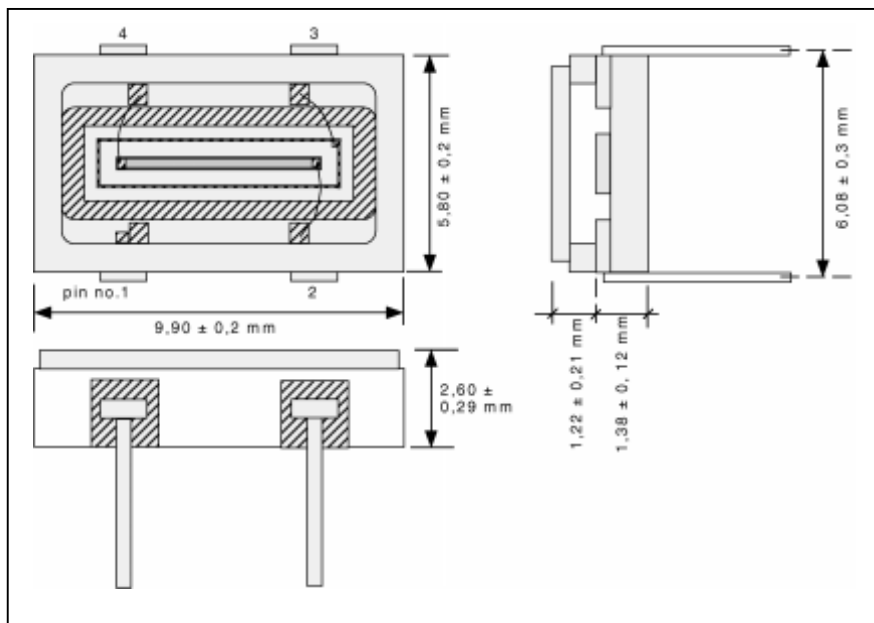
Typical applications include: distance and height measurements, alignment, position and motion measurements and vibration studies.



| Parameter | Symbol | Min. | Typ. | Max. | Unit |
|------------------------|--------------------|------|----------|------|-----------------|
| Active area | | | 5 x 0,25 | | mm ² |
| Position non-linearity | | | 0,1 | 0,2 | %(±) |
| Detector resistance | R _{det} | 160 | 200 | 300 | k Ω |
| Leakage current (dark) | I _d | | 4 | 20 | nA |
| Noise current | I _{noise} | | 0,3 | 0,6 | pA/√Hz |
| Responsivity | r | | 0,63 | | A/W |
| Capacitance | C _j | | 5 | 6 | pF |
| Rise time (10-90%) | t _r | | 250 | 400 | ns |
| Bias voltage (reverse) | V _r | 5 | 15 | 20 | V |
| Thermal drift | | | 20 | 100 | ppm/°C |
| Maximum ratings | | | | | |
| Reverse voltage | V _{R-max} | | | 30 | V |
| Operating temperature | T _{oper} | | | 70 | °C |
| Storage temperature | T _{stg} | | | 100 | °C |

Test conditions: Room temperature 23°C. Reverse voltage 15 V. Light-source wavelength 940 nm.
Position non-linearity and thermal drift are valid within 80% of the detector length.

Package: 4-pin ceramic DIL-package, 9,9 x 5,8 mm², with protective window.



1L5NT_CP1

Pin configuration:

| | |
|---|------------------|
| 1 | Bias |
| 2 | Output Y1 |
| 3 | Stray-light area |
| 4 | Output Y2 |

Note: Outputs Y1, Y2 are interchangeable.
The anodes Y1, Y2 must be at negative potential compared to the cathode. The stray-light area should be connected to ground.

Application information:

The inherent resolution of a PSD is very good. It is proven to be better than one part in one million. The performance of a PSD based measurement system is thus limited by its mechanical, optical and electrical components.

To get the best performance you have to consider:

- Modulated light source. Modulation makes it possible to avoid influence of other light sources.
- Stable temperature.
- Mechanical stable system.
- High optical resolution.
- High resolution in division of the sum- and difference of the PSD signals.

Resolution, optical sensitivity and measurement speed are related to each other in the PSD measurement system and you have to make the proper choices and tradeoffs for your system. Further information as schematics of a recommended hook-up is obtainable from your local distributor or from SiTek Electro Optics AB.

SiTek PSD Position Measurement electronic boards:

For most position measurement applications the SiTek PM-kit offers a complete and easy-to-use solution. It is a series of general purpose, high performance, low-noise electronic boards designed for SiTek PSD. You can easily build your own measurement system using our PM-kit. Further information is obtainable from your local distributor or from SiTek Electro Optics AB.