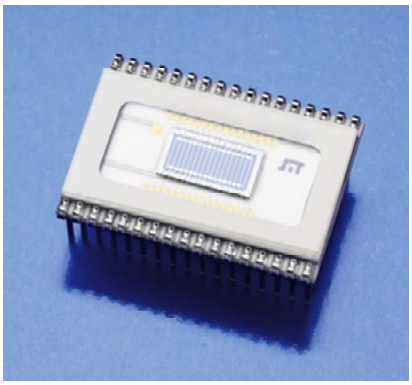
PSD Array

High Linearity Position Sensing Detector Array

Part number: **SA-0039**
Description: **1LA16-2,5_SU89**



The SiTek 1LA16-2,5_SU89 is a PSD array with 16 parallel 1-dimensional PSDs placed on the same chip. This enables simultaneous position read-out from the 16 segments and high speed 3D contour measurements with low cross talk betweens the segments. Each segment has the same high linearity and high speed as SiTeks standard 1-dimensional PSDs.
The PSD array has SiTeks unique built-in stray light elimination, a patented design which eliminates the decrease in speed and linearity due to stray light.
The PSD array can be used together with either a line laser or multiple laser beams.

Mechanical specification

Parameter	Value	Unit
Number of segments	16	
Active area of each segment	2,5 x 0,39	mm^2
Gap between segments	10	µm

Electrical specification

Parameter	Symbol	Min.	Typ.	Max.	Unit
Position non-linearity			0,1	0,2	%
Detector resistance	R_{det}	15	25	35	kΩ
Leakage current	I_d		2	10	nA
Noise current	I_{noise}		0,8	1,1	pA/√Hz
Responsivity	r		0,63		A/W
Capacitance	C_t		4	4,4	pF
Rise time (10% - 90%)	t_r		70	100	ns
Cross talk			0,5	1,0	%
Bias voltage (reverse)	V_R	5	15	20	V
Thermal drift			20	100	ppm/°C

Absolute maximum ratings

Parameter	Symbol	Value	Unit
Reverse voltage	$V_{R\text{-}max}$	30	V
Operating temperature	T_{oper}	70	°C
Storage temperature	T_{stg}	100	°C

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

Package: 34 pin DIP ceramic substrate, 21,6 x 15,0 mm^2, with protective window.

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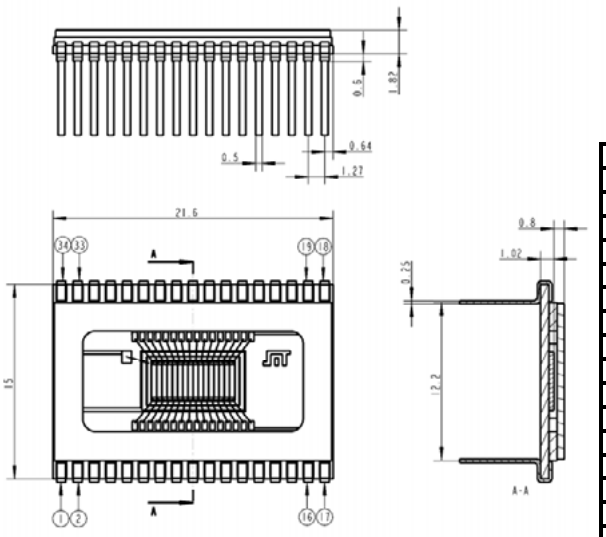
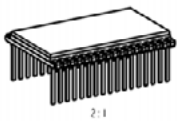
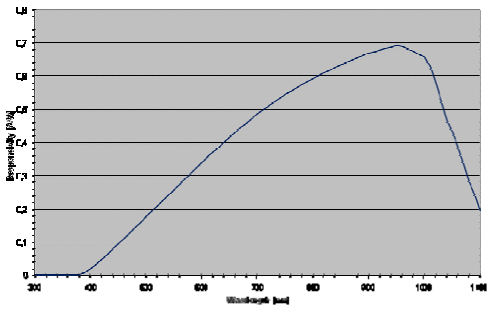




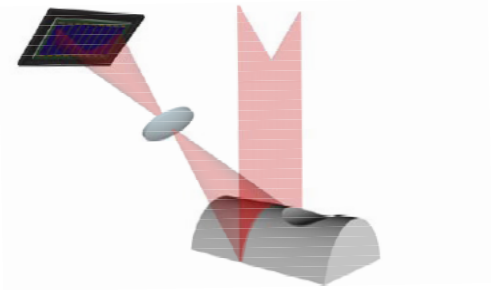
Pin	Input/Output	Pin	Input/Output
1	Bias	18	Y2 Segment 16
2	Y1 Segment 1	19	Y2 Segment 15
3	Y1 Segment 2	20	Y2 Segment 14
4	Y1 Segment 3	21	Y2 Segment 13
5	Y1 Segment 4	22	Y2 Segment 12
6	Y1 Segment 5	23	Y2 Segment 11
7	Y1 Segment 6	24	Y2 Segment 10
8	Y1 Segment 7	25	Y2 Segment 9
9	Y1 Segment 8	26	Y2 Segment 8
10	Y1 Segment 9	27	Y2 Segment 7
11	Y1 Segment 10	28	Y2 Segment 6
12	Y1 Segment 11	29	Y2 Segment 5
13	Y1 Segment 12	30	Y2 Segment 4
14	Y1 Segment 13	31	Y2 Segment 3
15	Y1 Segment 14	32	Y2 Segment 2
16	Y1 Segment 15	33	Y2 Segment 1
17	Y1 Segment 16	34	Stray light area

Note:
Outputs Y1, Y2 are interchangeable. The anodes Y1, Y2 must be at negative potential compared to the cathode (bias pin). The stray-light area should be connected to the same potential as the anodes.

Spectral responsivity



Application example



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 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 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.

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Information in this data sheet is believed to be reliable. However, no responsibility is assumed for possible inaccuracies or omissions. Specifications are subjected to changes without notice.

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