

SPC

Signal Processing Circuit for SiTek High Linearity Position Sensing Detector

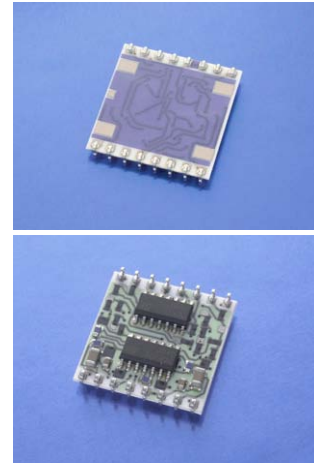
Partnumber: SE – 0010

Description: SPC01

The SiTek SPC01 is a signal processing circuit especially designed for use together with SiTek PSD. The PSD currents are output as bipolar voltages representing the position and intensity of the centroid of a light spot on the PSD. The intensity signal can be used for external normalisation of the position (difference) signal in regard to light intensity dependence.

Inputs are available for external adjustment of offset voltages.

In order to obtain maximum precision, high reliability and small size the SPC01 is built using thick film technology and laser trimmed resistors on a 20,5 x 20,5 mm² ceramic substrate. The SPC01 is delivered with surface mount leads.



Electrical specification

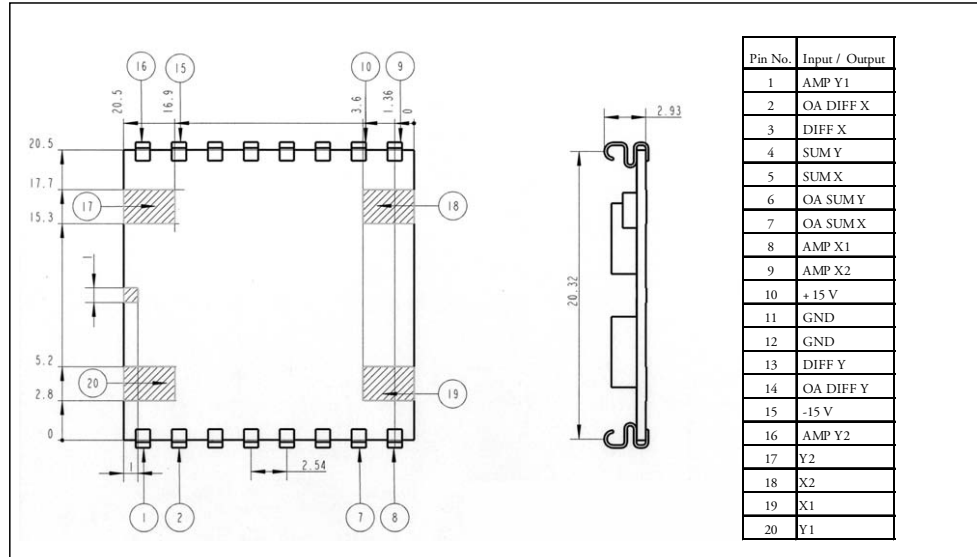
Parameter	Symbol	Min.	Typ.	Max.	Unit
Reverse bias	V_r		15		V
Transimpedance	R_f	$9,99 \cdot 10^4$	$10,0 \cdot 10^4$	$10,01 \cdot 10^4$	V/A
Amplification in sum and difference stages	A_v	0,999	1	1,001	
Output voltage	V_{out}			± 12	V
Output noise	V_{noise}		3		mVp-p
Bandwidth	f_{3dB}		400		kHz
Slew rate	SR	8	13		V/ μ s
Supply current			12	23	mA

Absolute maximum ratings

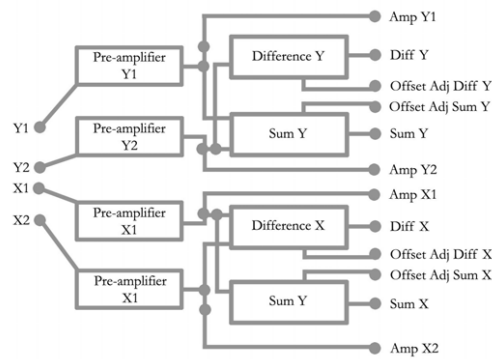
Parameter	Symbol	Value	Unit
Power supply voltage	V_s	± 18	V
Output short-circuit time		Continuous	
Operating temperature	T_{oper}	70	$^{\circ}$ C
Storage temperature	T_{stg}	100	$^{\circ}$ C

Test conditions: Room temperature 23 $^{\circ}$ C, Power supply voltage ± 15 V.

Package: 16 pin ceramic substrate, 20,5 x 20,5 mm².



Block schematics



Features

- Analogue outputs of all sum and differential signals
- Laser trimmed resistors
- Inputs for external adjustment of offset voltages
- Good thermal tracking
- Small size

Applications

- Analogue PSD front-end in displacement measuring systems for OEM as well as evaluation purposes.

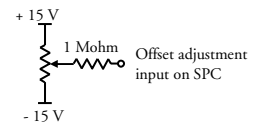
Application Information

Connection of 1-dimensional PSDs

When using the SPC together with a 1-dimensional PSD the PSD outputs Y1 and Y2 should be connected to the corresponding SPC outputs (pad 17 and 20) while the bias pin of the PSD should be connected to either pad 18 or 19 on the SPC (X1 and X2). Please note that when using the SPC together with a 1-dimensional device all X-related outputs (pin 2, 3, 5, 7, 8 and 9) must be left floating.

Offset compensation

Inputs 2, 6, 7 and 14 are used for external offset compensating voltages. Such a voltage can, as shown in the figure, be derived from a voltage divider and connected to the SPC input through a suitable series resistor.



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.