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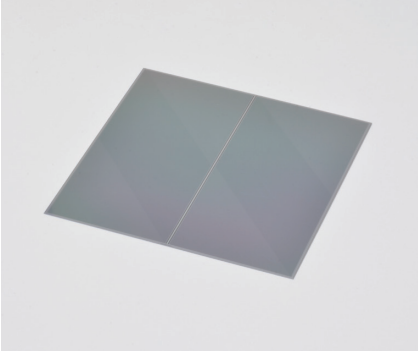
Si strip detector



S13804

Single-sided SSD for high energy particle position detection

The Si strip detector (SSD) is a Si photodiode with PN junctions (particle detection structures) that are several micrometers to several tens of micrometers in width arranged in a strip formation. Developed specifically for the J-PARC muon g-2/EDM experiment*, this SSD can detect precise incident positions of high-energy particles with remarkable accuracy. It has an active area of about 97 × 97 mm and can detect positions over a wide area.

Features

- **High voltage tolerance**
- **High radiation tolerance**
- **Low dark current**

* http://g-2.kek.jp/portal/index.html

Applications

- **High energy particle detection**

Structure

Parameter	Specification	Unit
Type	PolySi-bias AC-readout	-
Si thickness	320 ± 15	µm
Si crystal plane direction	<100>	-
Chip size	(98770 ± 20) × (98770 ± 20)	µm
Active area	97280 × 97280	µm
Strip layout	512 ch × 2 columns	-
Number of strips	1024	ch
Strip pitch	190	µm
Strip implant width	80	µm
Strip readout Al width	90	µm
Readout pad size	165 × 100 × 2	µm

Absolute maximum ratings

Parameter	Symbol	Condition	Value	Unit
Reverse voltage	V_R		200	V
Operating temperature	Topr	No dew condensation*	-20 to +60	°C
Storage temperature	Tstr	No dew condensation*	-40 to +100	°C

* When there is a temperature difference between a product and the surrounding area in high humidity environments, dew condensation may occur on the product surface. Dew condensation on the product may cause deterioration in characteristics and reliability.

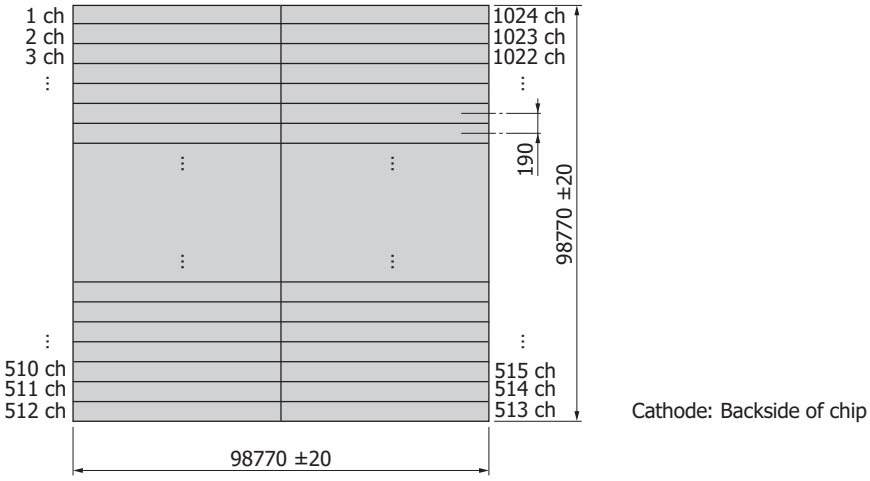
Note: Exceeding the absolute maximum ratings even momentarily may cause a drop in product quality. Always be sure to use the product within the absolute maximum ratings.

Electrical and optical characteristics (Ta=25 °C)

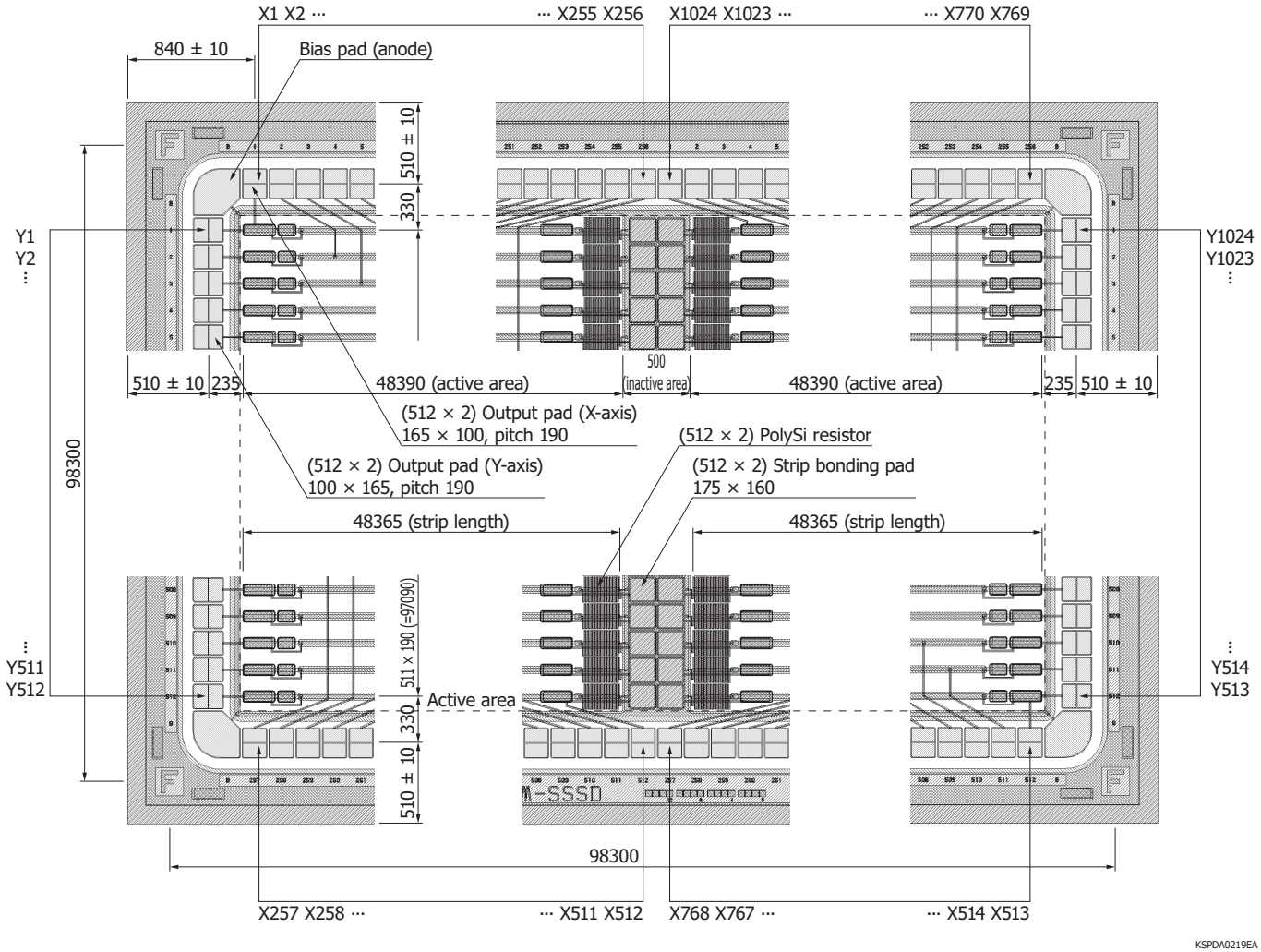
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Breakdown voltage	V_{BR}		200	-	-	V
Dark current	I_D	V_R=200 V	-	-	3	µA
Full depletion voltage	Vfd		-	-	100	V
Defective strip rate	-		-	-	5	%
PolySi resistor	Rpoly		5	10	15	MΩ

Dimensional outline (unit: µm)

■ Entire device drawing



■ Detailed chip diagram

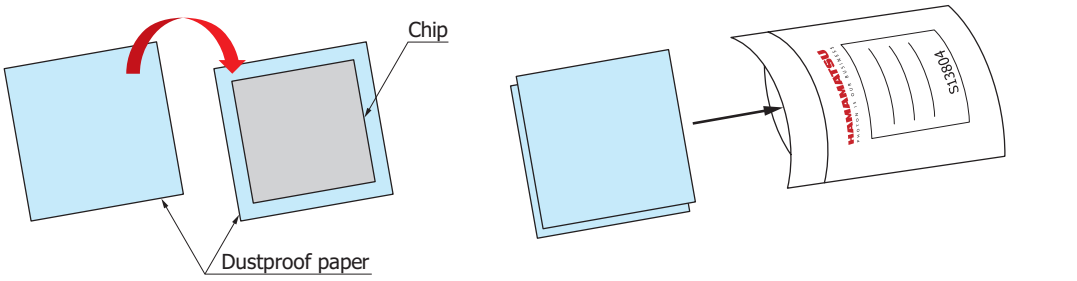


Note: The output pad connection is X1 or Y1: 1 ch, X2 or Y2: 2 ch, ··· X1024 or Y1024: 1024 ch. The pad arrangement allows the chip to be mounted in a 90° rotated state.

Standard packing specifications

■ Individual packing

Each chip is placed between two dustproof sheets (thick paper) and stored in a dedicated envelope (135 × 135 mm).
On the front of the envelope, the type number, lot number, and serial number are indicated.



KSPDC0098EA

■ Packing type

Dedicated envelope and desiccant in moisture-proof packaging (vacuum-sealed)

Related information

www.hamamatsu.com/sp/ssd/doc_en.html

■ Precautions

· Disclaimer

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