

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. It is an SSD developed for J-PARC muon g-2/EDM experiment* and can detect incident positions of high energy particles with high 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	T _{opr}	No dew condensation*	-20 to +60	°C
Storage temperature	T _{str}	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.

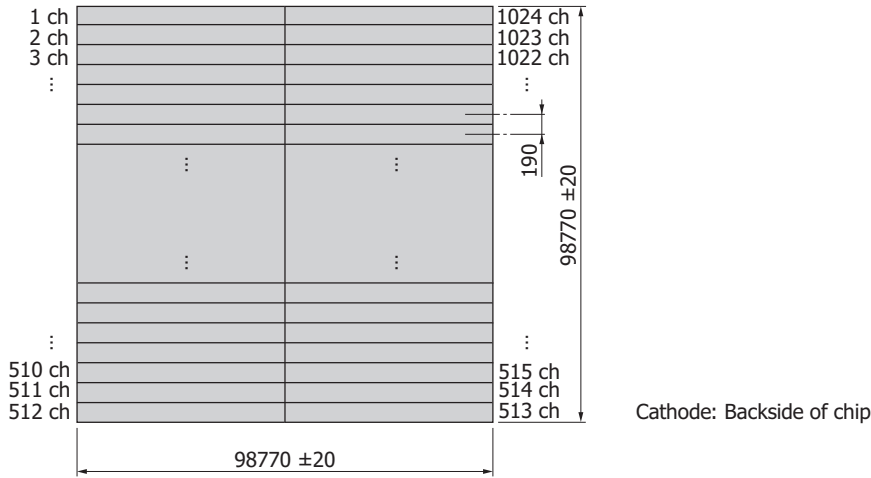
Note: Exceeding the absolute maximum ratings even momentarily may cause a drop in product quality. Always be sure to use the product within the absolute maximum ratings.

Electrical and optical characteristics (T_a=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	V _{fd}		-	-	100	V
Defective strip rate	-		-	-	5	%
PolySi resistor	R _{poly}		5	10	15	MΩ

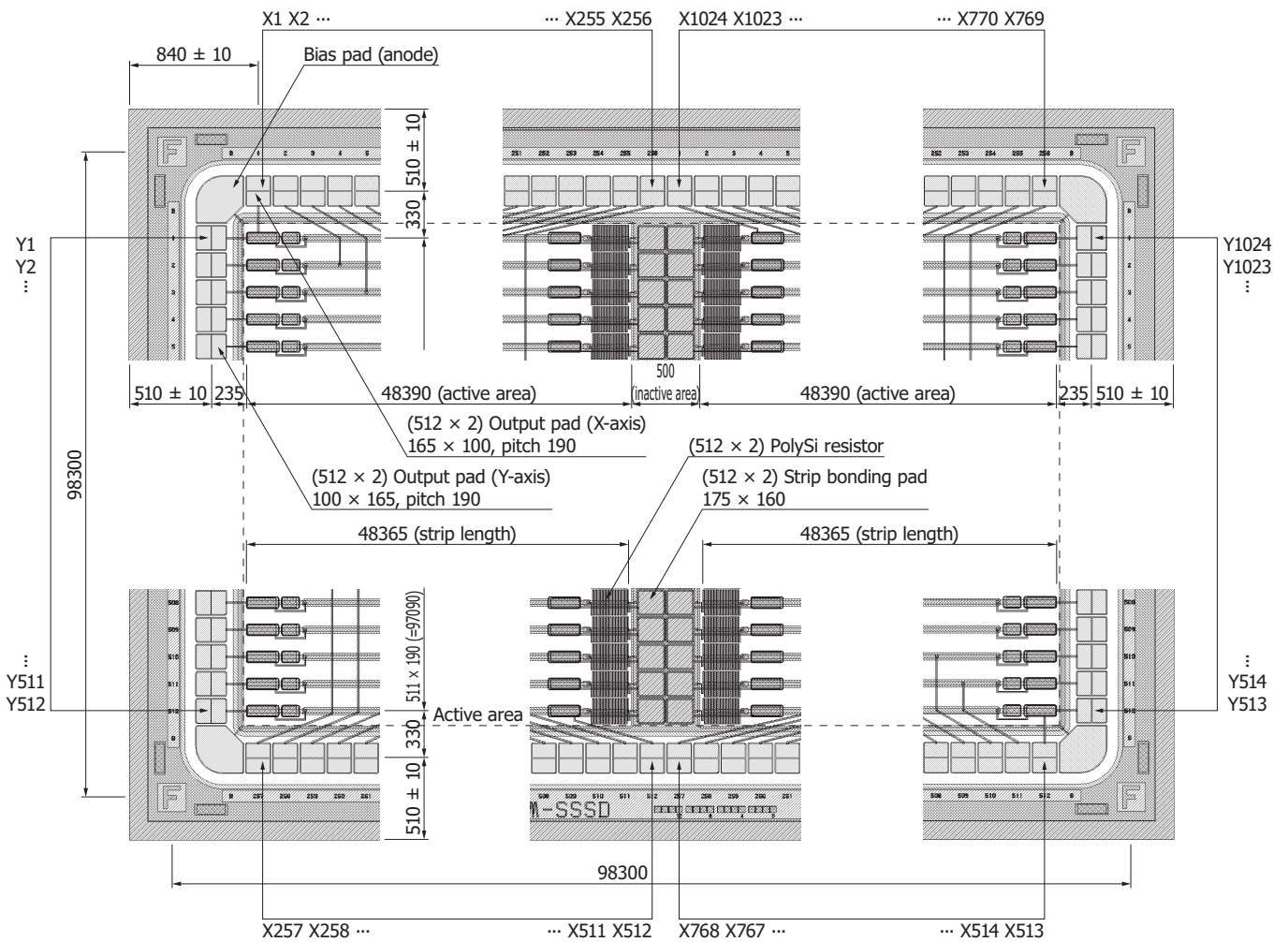
Dimensional outline (unit: μm)

■ Entire device drawing



KSPDA0220EA

■ Detailed chip diagram



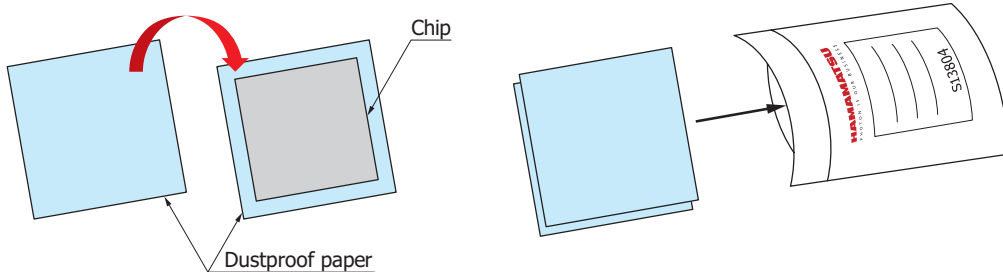
KSPDA0219EA

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

Information described in this material is current as of January 2021.

Product specifications are subject to change without prior notice due to improvements or other reasons. This document has been carefully prepared and the information contained is believed to be accurate. In rare cases, however, there may be inaccuracies such as text errors. Before using these products, always contact us for the delivery specification sheet to check the latest specifications.

The product warranty is valid for one year after delivery and is limited to product repair or replacement for defects discovered and reported to us within that one year period. However, even if within the warranty period we accept absolutely no liability for any loss caused by natural disasters or improper product use. Copying or reprinting the contents described in this material in whole or in part is prohibited without our prior permission.

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