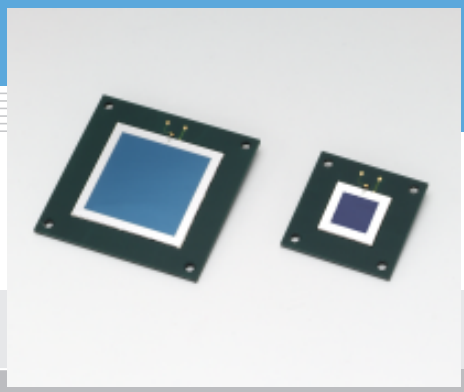


# Si PIN photodiode S9723, S9724

## Large area Si PIN photodiode for direct detection



S9723 and S9724 are large-area Si detectors specifically designed for the direct detection of high-energy charged particles and X-rays. These Si detectors are mounted on PC boards with holes for the purpose of  $\Delta E$ -E detection of charged particles. These detector's thicknesses are  $100 \pm 5 \mu\text{m}$  (S9723) and  $10 \pm 2.5 \mu\text{m}$  (S9724). Thickness uniformities of the active area are as good as  $2.0 \mu\text{m}$  Typ. (S9723) and  $1.0 \mu\text{m}$  Typ. (S9724). This ensures excellent sensitivity uniformity over the entire active area.

### Features

- Large area
- Low dark current
- Thickness uniformity \*1 :  $2 \mu\text{m}$  (S9723)  
 $1 \mu\text{m}$  (S9724)
- Active area :  $26 \times 26 \times 0.1 \text{ }^{\dagger} \text{mm}$  (S9723)  
 $10 \times 10 \times 0.01 \text{ }^{\dagger} \text{mm}$  (S9724)

### Applications

- Heavy ions energy detection
- X-ray detection
- $\Delta E$ -E detection

### ■ Specifications/Absolute maximum ratings

Parameter	Symbol	S9723	S9724	Unit
Active area	-	$26 \times 26$	$10 \times 10$	mm
Detector thickness	-	$100 \pm 5$	$10 \pm 2.5$	$\mu\text{m}$
Thickness uniformity *1	-	2.0	1.0	$\mu\text{m}$
Surface orientation	-	(111)		-
Dead layer thickness *2	Front side	1		$\mu\text{m}$
	Rear side	1		
Reverse voltage	$V_R$ Max.	20	2	V
Current	-	2		mA
Operating temperature *3	$T_{opr}$	0 to +60		$^{\circ}\text{C}$
Storage temperature *3	$T_{stg}$	0 to +80		$^{\circ}\text{C}$

\*1: Variation in the detector thickness

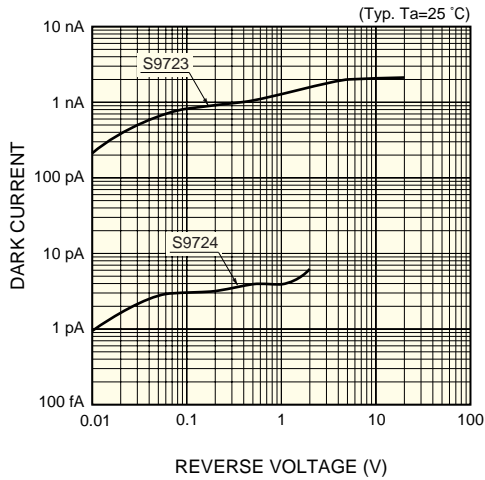
\*2: Reference value

\*3: No condensation

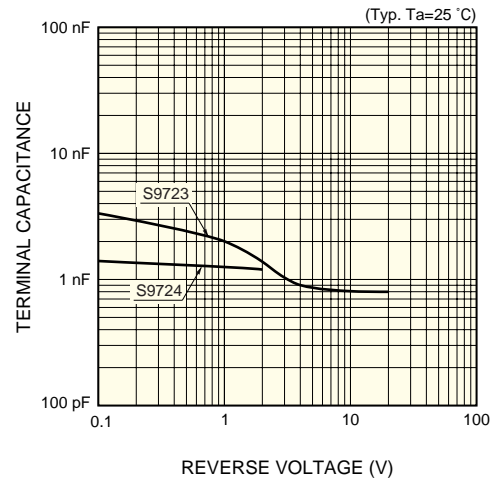
### ■ Electrical and optical characteristics (Typ. $T_a=25 \text{ }^{\circ}\text{C}$ , unless otherwise noted)

Parameter	Symbol	Condition	S9723			S9724			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	
Full depletion voltage	$V_D$		-	5	10	-	0.5	1	V
Dark current	$I_D$	$V_R=V_D$	-	2	50	-	0.01	0.1	nA
Rise time	$t_r$	$V_R=V_D, R_L=50 \Omega$	-	80	-	-	100	-	ns
Terminal capacitance	$C_t$	$V_R=V_D, f=1 \text{ MHz}$	-	0.75	-	-	1	-	nF

## ■ Dark current vs. reverse voltage



## ■ Terminal capacitance vs. reverse voltage



## ■ Dimensional outlines (unit: mm, tolerance unless otherwise noted: ±0.2)

S9723

S9724

