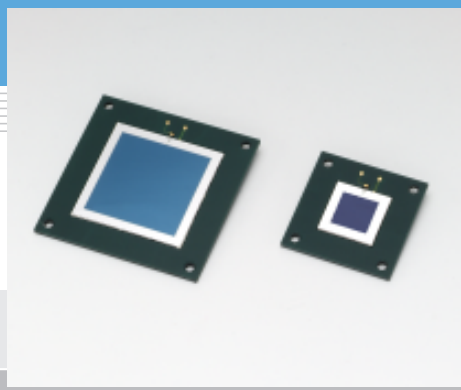


Si PIN photodiode S9723, S9724

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 ΔE -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
- ΔE -E detection

■ Specifications/Absolute maximum ratings

| Parameter | Symbol | S9723 | S9724 | Unit |
|--------------------------|------------|----------------|----------------|--------------------|
| Active area | - | 26×26 | 10×10 | mm |
| Detector thickness | - | 100 ± 5 | 10 ± 2.5 | μm |
| Thickness uniformity *1 | - | 2.0 | 1.0 | μm |
| Surface orientation | - | (111) | | - |
| Dead layer thickness *2 | Front side | 1 | | μm |
| | 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

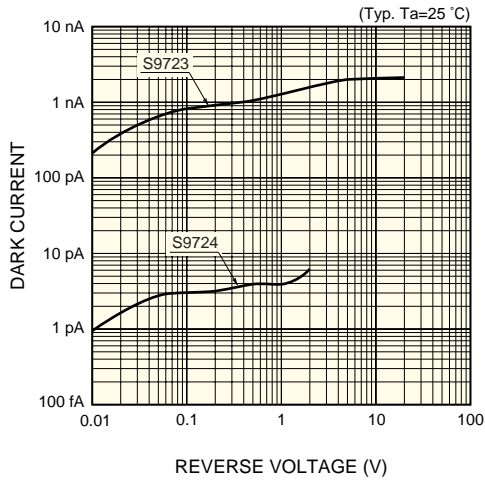
*2: Reference value

*3: No condensation

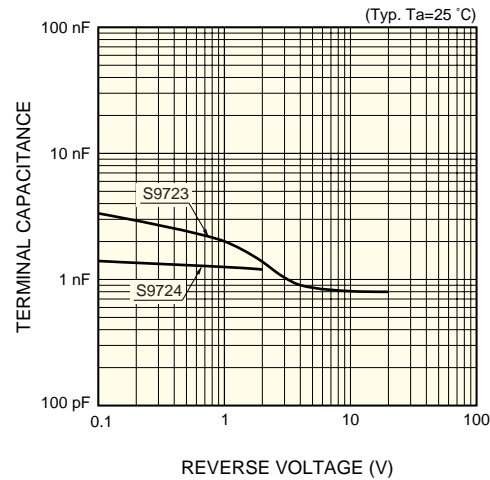
■ Electrical and optical characteristics (Typ. $T_a=25 \text{ }^{\circ}\text{C}$, unless otherwise noted)

| 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



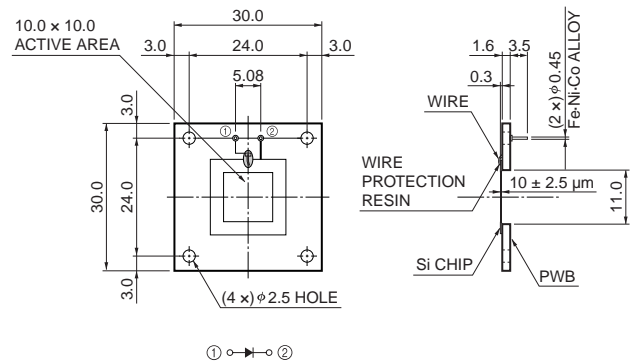
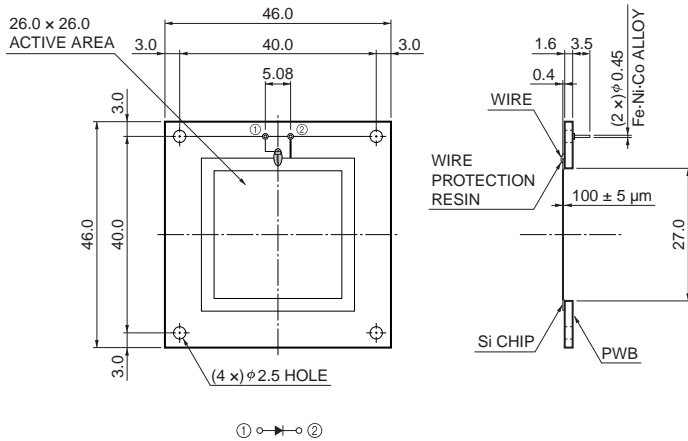
■ Terminal capacitance vs. reverse voltage



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

S9723

S9724



HAMAMATSU

Information furnished by HAMAMATSU is believed to be reliable. However, no responsibility is assumed for possible inaccuracies or omissions. Specifications are subject to change without notice. No patent rights are granted to any of the circuits described herein. ©2004 Hamamatsu Photonics K.K.

HAMAMATSU PHOTONICS K.K., Solid State Division

1126-1 Ichino-cho, Hamamatsu City, 435-8558 Japan, Telephone: (81) 053-434-3311, Fax: (81) 053-434-5184, <http://www.hamamatsu.com>

U.S.A.: Hamamatsu Corporation, 360 Foothill Road, P.O.Box 6910, Bridgewater, N.J. 08807-0910, U.S.A., Telephone: (1) 908-231-0960, Fax: (1) 908-231-1218

Germany: Hamamatsu Photonics Deutschland GmbH: Arzbergerstr. 10, D-82211 Herrsching am Ammersee, Germany, Telephone: (49) 08152-3750, Fax: (49) 08152-2658

France: Hamamatsu Photonics France S.A.R.L.: 8, Rue du Saule Trapu, Parc du Moulin de Massy, 91882 Massy Cedex, France, Telephone: 33-(1) 69 53 71 00, Fax: 33-(1) 69 53 71 10

United Kingdom: Hamamatsu Photonics UK Limited: 2 Howard Court, 10 Tewin Road, Welwyn Garden City, Hertfordshire AL7 1BW, United Kingdom, Telephone: (44) 1707-294888, Fax: (44) 1707-325777

North Europe: Hamamatsu Photonics Norden AB: Smidesvägen 12, SE-171 41 Solna, Sweden, Telephone: (46) 8-509-031-00, Fax: (46) 8-509-031-01

Italy: Hamamatsu Photonics Italia S.R.L.: Strada della Moia, 1/E, 20020 Arese, (Milano), Italy, Telephone: (39) 02-935-81-733, Fax: (39) 02-935-81-741