



# Si PIN photodiodes

S2506 series

S6775 series

S6967

## Plastic SIP (single in-line package)

S2506/S6775 series and S6967 are Si PIN photodiodes with large active areas, molded into a clear or visible-cut plastic SIP for detecting visible to near infrared range or near infrared range only. These Si PIN photodiodes feature high sensitivity, high-speed response and large active areas.

### Features

- **S2506-02: Visible to near infrared range**  
**S2506-04: Visible-cut**  
**S6775, S6967: Visible to near infrared range, high sensitivity, high-speed response, large active area**
- **S6775-01: Visible-cut, high sensitivity, high-speed response, large active area**
- **Plastic package: 7 × 7.8 mm**
- **Photosensitive area size**  
**S2506 series: 2.77 × 2.77 mm**  
**S6775 series, S6967: 5.5 × 4.8 mm**

### Applications

- **FSO (free space optics)**
- **Optical switches**
- **Laser radar, etc.**

### General ratings / Absolute maximum ratings

| Type no. | Package | Photosensitive<br>area size<br><br>(mm) | Effective<br>photosensitive<br>area<br><br>(mm²) | Absolute maximum ratings                         |                                   |                                                      |                                                    |  |  |  |  |
|----------|---------|-----------------------------------------|--------------------------------------------------|--------------------------------------------------|-----------------------------------|------------------------------------------------------|----------------------------------------------------|--|--|--|--|
|          |         |                                         |                                                  | Reverse<br>voltage<br>V <sub>R</sub> max.<br>(V) | Power<br>dissipation<br>P<br>(mW) | Operating<br>temperature<br>T <sub>opr</sub><br>(°C) | Storage<br>temperature<br>T <sub>stg</sub><br>(°C) |  |  |  |  |
| S2506-02 | Plastic | 2.77 × 2.77                             | 7.7                                              | 35                                               | 150                               | -25 to +85                                           | -40 to +100                                        |  |  |  |  |
| S2506-04 |         |                                         |                                                  |                                                  | 50                                |                                                      |                                                    |  |  |  |  |
| S6775    |         | 5.5 × 4.8                               | 26.4                                             |                                                  |                                   |                                                      |                                                    |  |  |  |  |
| S6775-01 |         |                                         |                                                  |                                                  |                                   |                                                      |                                                    |  |  |  |  |
| S6967    |         |                                         |                                                  |                                                  |                                   |                                                      |                                                    |  |  |  |  |

### Electrical and optical characteristics (Typ. T<sub>a</sub>=25 °C, unless otherwise noted)

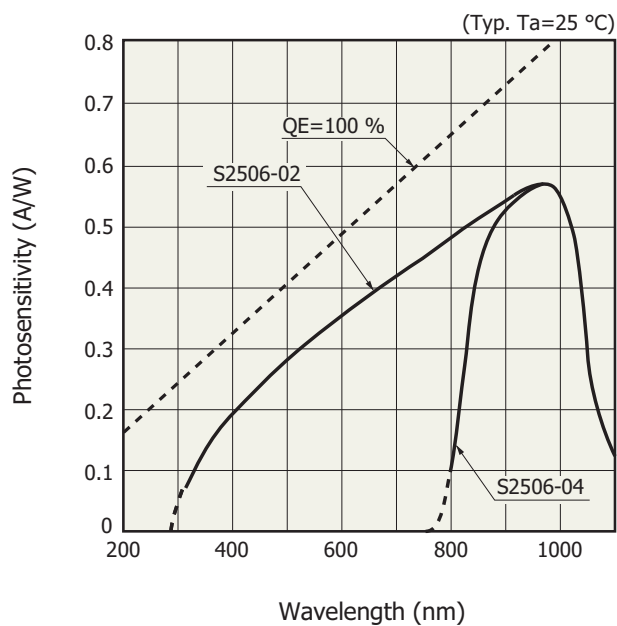
| Type no. | Spectral response range<br>λ<br>(nm) | Peak sensitivity wavelength<br>λp<br>(nm) | Photosensitivity<br>S<br>(A/W) |        |        |        | Short circuit current<br>Isc<br>100 lx<br>(μA) | Dark current<br>ID |           | Temp. coefficient of ID<br>TCID<br>(times/°C) | Cut-off frequency<br>fc<br>RL=50 Ω<br>-3 dB<br>(MHz) | Terminal capacitance<br>Ct<br>f=1 MHz<br>(pF) | NEP<br><br>(W/Hz <sup>1/2</sup> ) |
|----------|--------------------------------------|-------------------------------------------|--------------------------------|--------|--------|--------|------------------------------------------------|--------------------|-----------|-----------------------------------------------|------------------------------------------------------|-----------------------------------------------|-----------------------------------|
|          |                                      |                                           | λp                             | 660 nm | 780 nm | 830 nm |                                                | Typ. (nA)          | Max. (nA) |                                               |                                                      |                                               |                                   |
| S2506-02 | 320 to 1100                          | 960                                       | 0.56                           | 0.4    | 0.48   | 0.5    | 7.3                                            | 0.1*1              | 10*1      | 1.15                                          | 25*1                                                 | 15*1                                          | 1.0 × 10 <sup>-14*1</sup>         |
| S2506-04 | 760 to 1100                          |                                           |                                | -      | -      | 0.25   | 4.1                                            |                    |           |                                               |                                                      |                                               |                                   |
| S6775    | 320 to 1100                          | 960                                       | 0.7                            | 0.45   | 0.55   | 0.6    | 30                                             | 0.5*2              | 10*2      |                                               | 15*2                                                 | 40*2                                          | 1.8 × 10 <sup>-14*2</sup>         |
| S6775-01 | 700 to 1100                          |                                           |                                | 0.68   | -      | 0.48   | 0.54                                           |                    |           |                                               |                                                      |                                               | 21                                |
| S6967    | 320 to 1060                          | 900                                       | 0.65                           | 0.45   | 0.55   | 0.6    | 26                                             |                    |           |                                               | 5*2                                                  | 50*2                                          | 50*2                              |

\*1: V<sub>R</sub>=12 V

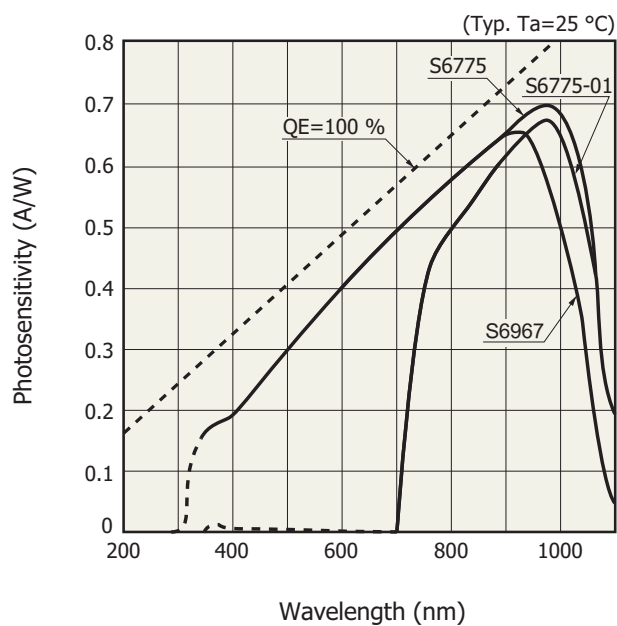
\*2: V<sub>R</sub>=10 V

## Spectral response

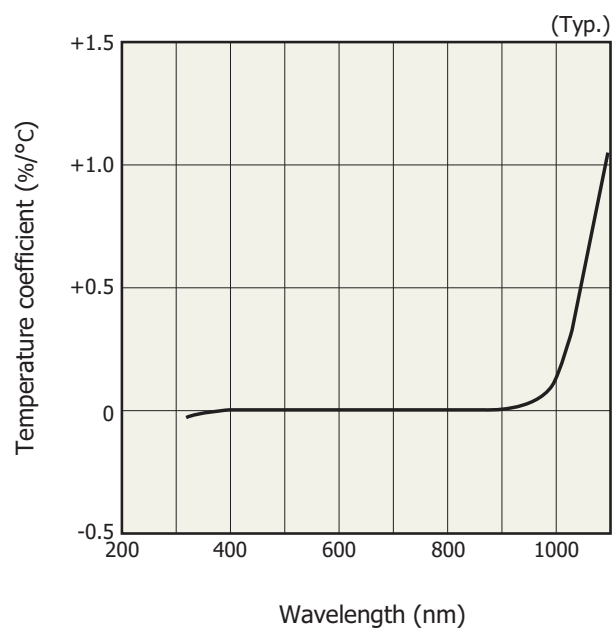
S2506 series



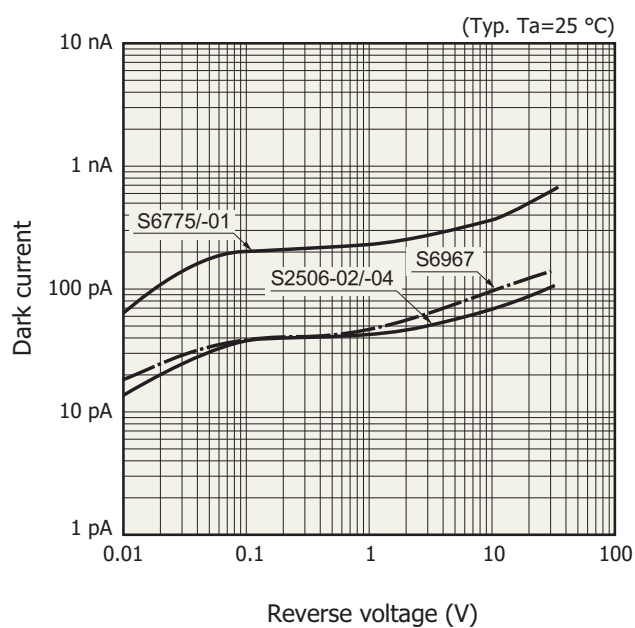
S6775 series, S6967



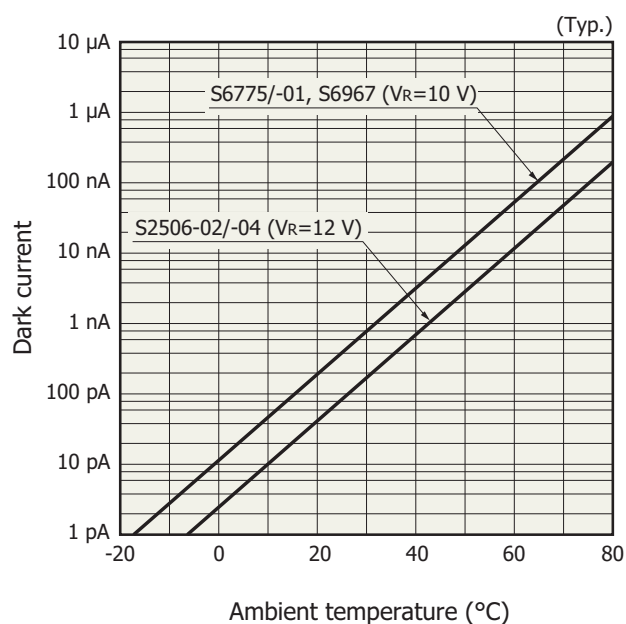
## Photo sensitivity temperature characteristic (S2506-02)



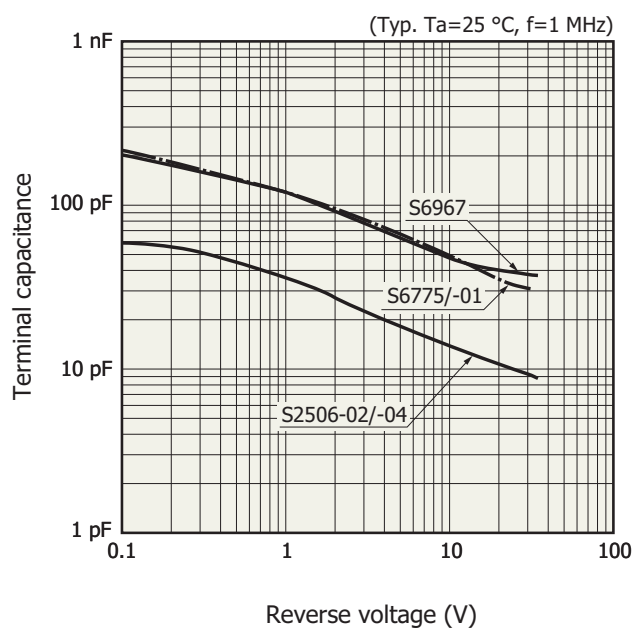
## Dark current vs. reverse voltage



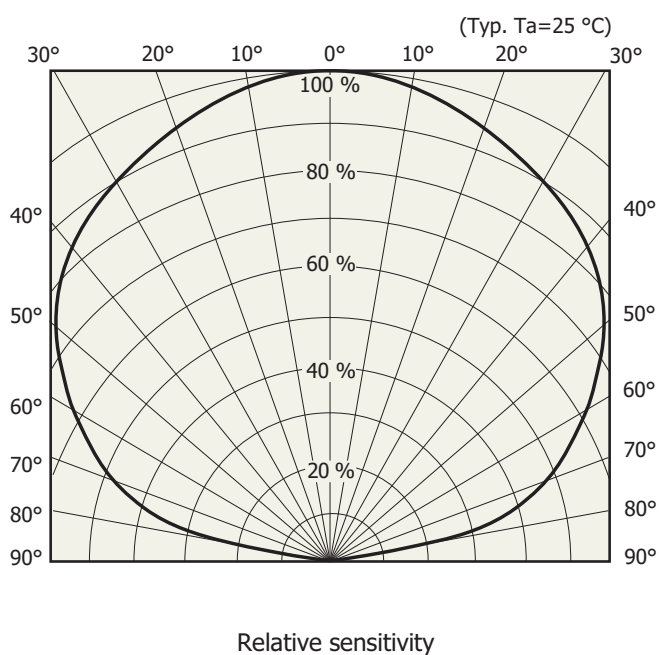
### Dark current vs. ambient temperature



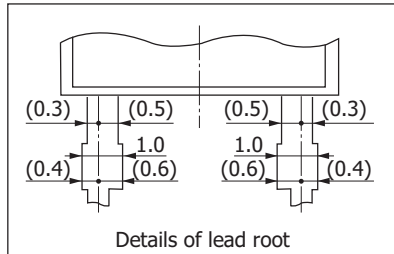
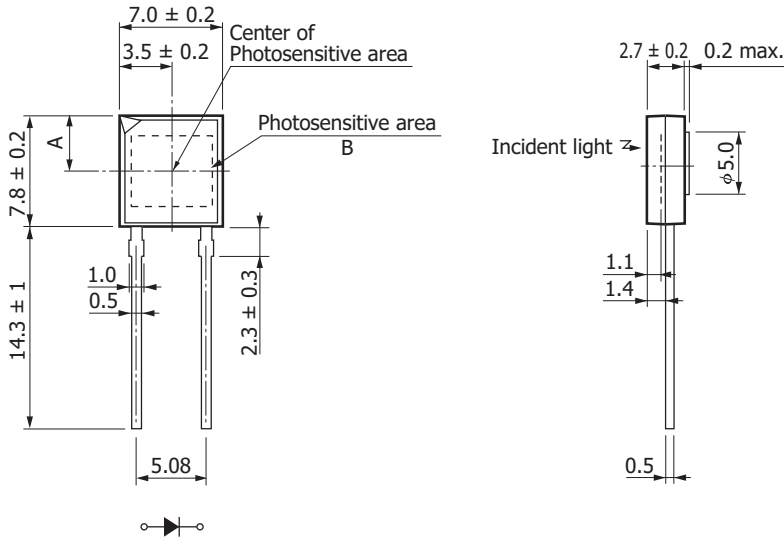
### Terminal capacitance vs. reverse voltage



### Directivity (S2506-02)



**Dimensional outline (unit: mm, tolerance unless otherwise noted:  $\pm 0.1$ )**



| Type no.              | A              | B                  |
|-----------------------|----------------|--------------------|
| S2506 series          | $2.8 \pm 0.2$  | $2.77 \times 2.77$ |
| S6775/series<br>S6967 | $3.65 \pm 0.2$ | $5.5 \times 4.8$   |

Lead surface finish: Silver plating  
Packing: Polyethylene pack [anti-static type]  
(200 pcs/pack)

KPINA0084ED

Information described in this material is current as of December, 2011.

Product specifications are subject to change without prior notice due to improvements or other reasons. Before assembly into final products, please contact us for the delivery specification sheet to check the latest information.

Type numbers of products listed in the delivery specification sheets or supplied as samples may have a suffix "(X)" which means preliminary specifications or a suffix "(Z)" which means developmental 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.

# HAMAMATSU

www.hamamatsu.com

HAMAMATSU PHOTONICS K.K., Solid State Division

1126-1 Ichino-cho, Higashi-ku, Hamamatsu City, 435-8558 Japan, Telephone: (81) 53-434-3311, Fax: (81) 53-434-5184

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) 8152-375-0, Fax: (49) 8152-265-8

France: Hamamatsu Photonics France S.A.R.L.: 19, Rue du Saule Trappu, 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 int. 6, 20020 Arese, (Milano), Italy, Telephone: (39) 02-935-81-733, Fax: (39) 02-935-81-741

China: Hamamatsu Photonics (China) Co., Ltd.: 1201 Tower B, Jiaming Center, No.27 Dongsanhuan Bellu, Chaoyang District, Beijing 100020, China, Telephone: (86) 10-6586-6006, Fax: (86) 10-6586-2866