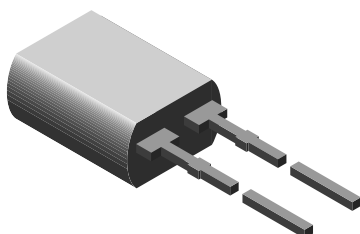


## Silicon PIN Photodiode



94 8632

### DESCRIPTION

BPW46 is a PIN photodiode with high speed and high radiant sensitivity in a clear, side view plastic package. It is sensitive to visible and near infrared radiation.

### FEATURES

- Package type: leaded
- Package form: side view
- Dimensions (L x W x H in mm): 5 x 3 x 6.4
- Radiant sensitive area (in mm<sup>2</sup>): 7.5
- High photo sensitivity
- High radiant sensitivity
- Suitable for visible and near infrared radiation
- Fast response times
- Angle of half sensitivity:  $\phi = \pm 65^\circ$
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
**GREEN**  
(5-2008)

### APPLICATIONS

- High speed photo detector

### PRODUCT SUMMARY

| COMPONENT | $I_{ra}$ (μA) | $\phi$ (deg) | $\lambda_{0.1}$ (nm) |
|-----------|---------------|--------------|----------------------|
| BPW46     | 50            | $\pm 65$     | 430 to 1100          |

#### Note

- Test condition see table "Basic Characteristics"

### ORDERING INFORMATION

| ORDERING CODE | PACKAGING | REMARKS                      | PACKAGE FORM |
|---------------|-----------|------------------------------|--------------|
| BPW46         | Bulk      | MOQ: 4000 pcs, 4000 pcs/bulk | Side view    |

#### Note

- MOQ: minimum order quantity

### ABSOLUTE MAXIMUM RATINGS ( $T_{amb} = 25^\circ\text{C}$ , unless otherwise specified)

| PARAMETER                           | TEST CONDITION                               | SYMBOL     | VALUE       | UNIT             |
|-------------------------------------|----------------------------------------------|------------|-------------|------------------|
| Reverse voltage                     |                                              | $V_R$      | 60          | V                |
| Power dissipation                   | $T_{amb} \leq 25^\circ\text{C}$              | $P_V$      | 215         | mW               |
| Junction temperature                |                                              | $T_j$      | 100         | $^\circ\text{C}$ |
| Operating temperature range         |                                              | $T_{amb}$  | -40 to +100 | $^\circ\text{C}$ |
| Storage temperature range           |                                              | $T_{stg}$  | -40 to +100 | $^\circ\text{C}$ |
| Soldering temperature               | $t \leq 5\text{ s}$                          | $T_{sd}$   | 260         | $^\circ\text{C}$ |
| Thermal resistance junction/ambient | Connected with Cu wire, 0.14 mm <sup>2</sup> | $R_{thJA}$ | 350         | K/W              |

| <b>BASIC CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) |                                                                            |                 |      |                     |      |                             |
|-----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|-----------------|------|---------------------|------|-----------------------------|
| PARAMETER                                                                                           | TEST CONDITION                                                             | SYMBOL          | MIN. | TYP.                | MAX. | UNIT                        |
| Breakdown voltage                                                                                   | $I_R = 100\text{ }\mu\text{A}$ , $E = 0$                                   | $V_{(BR)}$      | 60   |                     |      | V                           |
| Reverse dark current                                                                                | $V_R = 10\text{ V}$ , $E = 0$                                              | $I_{ro}$        |      | 2                   | 30   | nA                          |
| Diode capacitance                                                                                   | $V_R = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$                          | $C_D$           |      | 70                  |      | pF                          |
|                                                                                                     | $V_R = 3\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$                          | $C_D$           |      | 25                  | 40   | pF                          |
| Open circuit voltage                                                                                | $E_e = 1\text{ mW/cm}^2$ , $\lambda = 950\text{ nm}$                       | $V_o$           |      | 350                 |      | mV                          |
| Temperature coefficient of $V_o$                                                                    | $E_e = 1\text{ mW/cm}^2$ , $\lambda = 950\text{ nm}$                       | $TK_{V_o}$      |      | -2.6                |      | mV/K                        |
| Short circuit current                                                                               | $E_A = 1\text{ klx}$                                                       | $I_k$           |      | 70                  |      | $\mu\text{A}$               |
|                                                                                                     | $E_e = 1\text{ mW/cm}^2$ , $\lambda = 950\text{ nm}$                       | $I_k$           |      | 47                  |      | $\mu\text{A}$               |
| Temperature coefficient of $I_k$                                                                    | $E_e = 1\text{ mW/cm}^2$ , $\lambda = 950\text{ nm}$                       | $TK_{I_k}$      |      | 0.1                 |      | %/K                         |
| Reverse light current                                                                               | $E_A = 1\text{ klx}$ , $V_R = 5\text{ V}$                                  | $I_{ra}$        |      | 75                  |      | $\mu\text{A}$               |
|                                                                                                     | $E_e = 1\text{ mW/cm}^2$ , $\lambda = 950\text{ nm}$ , $V_R = 5\text{ V}$  | $I_{ra}$        | 40   | 50                  |      | $\mu\text{A}$               |
| Angle of half sensitivity                                                                           |                                                                            | $\varphi$       |      | $\pm 65$            |      | deg                         |
| Wavelength of peak sensitivity                                                                      |                                                                            | $\lambda_p$     |      | 900                 |      | nm                          |
| Range of spectral bandwidth                                                                         |                                                                            | $\lambda_{0.1}$ |      | 430 to 1100         |      | nm                          |
| Noise equivalent power                                                                              | $V_R = 10\text{ V}$ , $\lambda = 950\text{ nm}$                            | NEP             |      | $4 \times 10^{-14}$ |      | $\text{W}/\sqrt{\text{Hz}}$ |
| Rise time                                                                                           | $V_R = 10\text{ V}$ , $R_L = 1\text{ k}\Omega$ , $\lambda = 820\text{ nm}$ | $t_r$           |      | 100                 |      | ns                          |
| Fall time                                                                                           | $V_R = 10\text{ V}$ , $R_L = 1\text{ k}\Omega$ , $\lambda = 820\text{ nm}$ | $t_f$           |      | 100                 |      | ns                          |

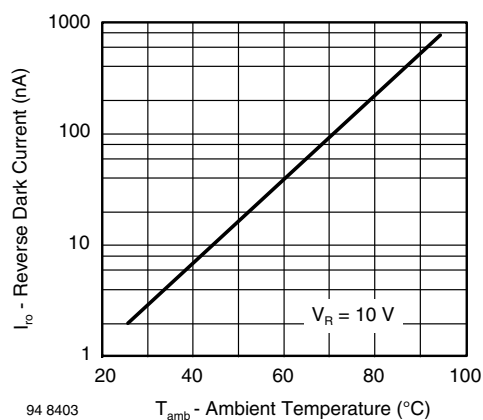
**BASIC CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

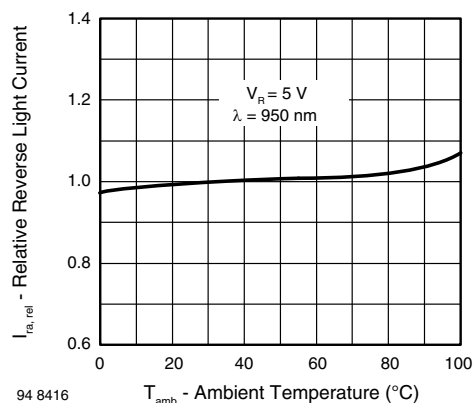


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

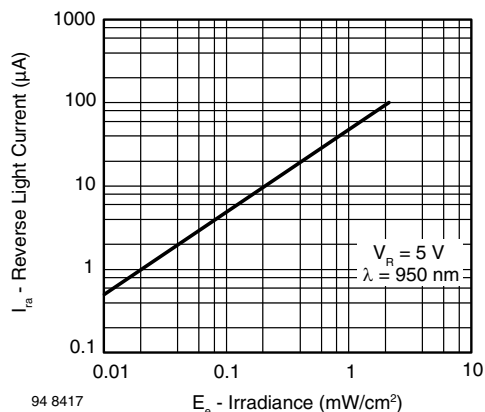


Fig. 3 - Reverse Light Current vs. Irradiance

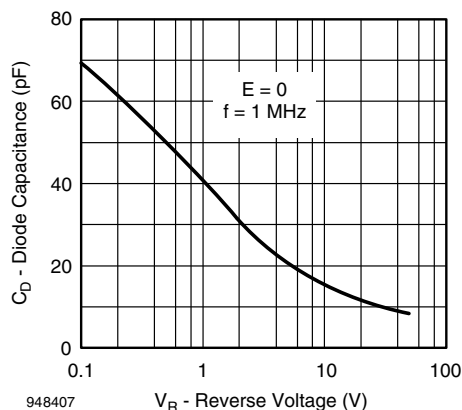


Fig. 6 - Diode Capacitance vs. Reverse Voltage

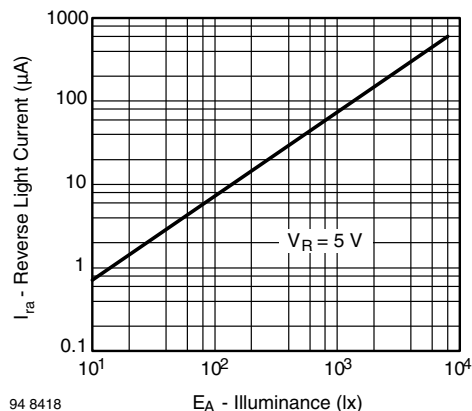


Fig. 4 - Reverse Light Current vs. Illuminance

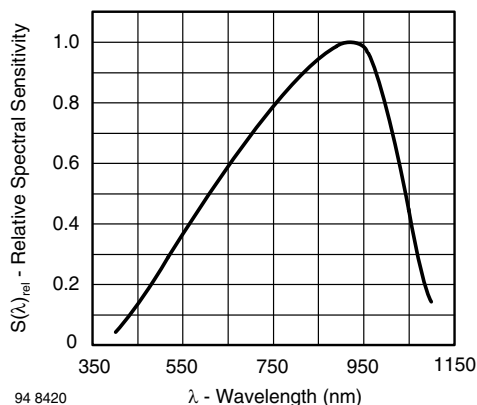


Fig. 7 - Relative Spectral Sensitivity vs. Wavelength

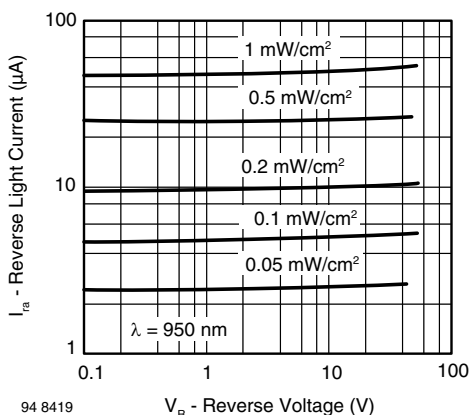


Fig. 5 - Reverse Light Current vs. Reverse Voltage

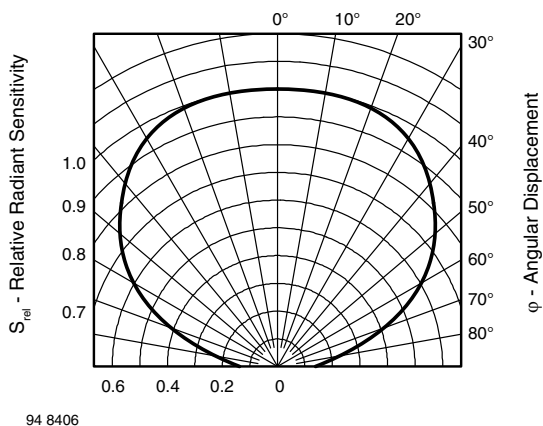
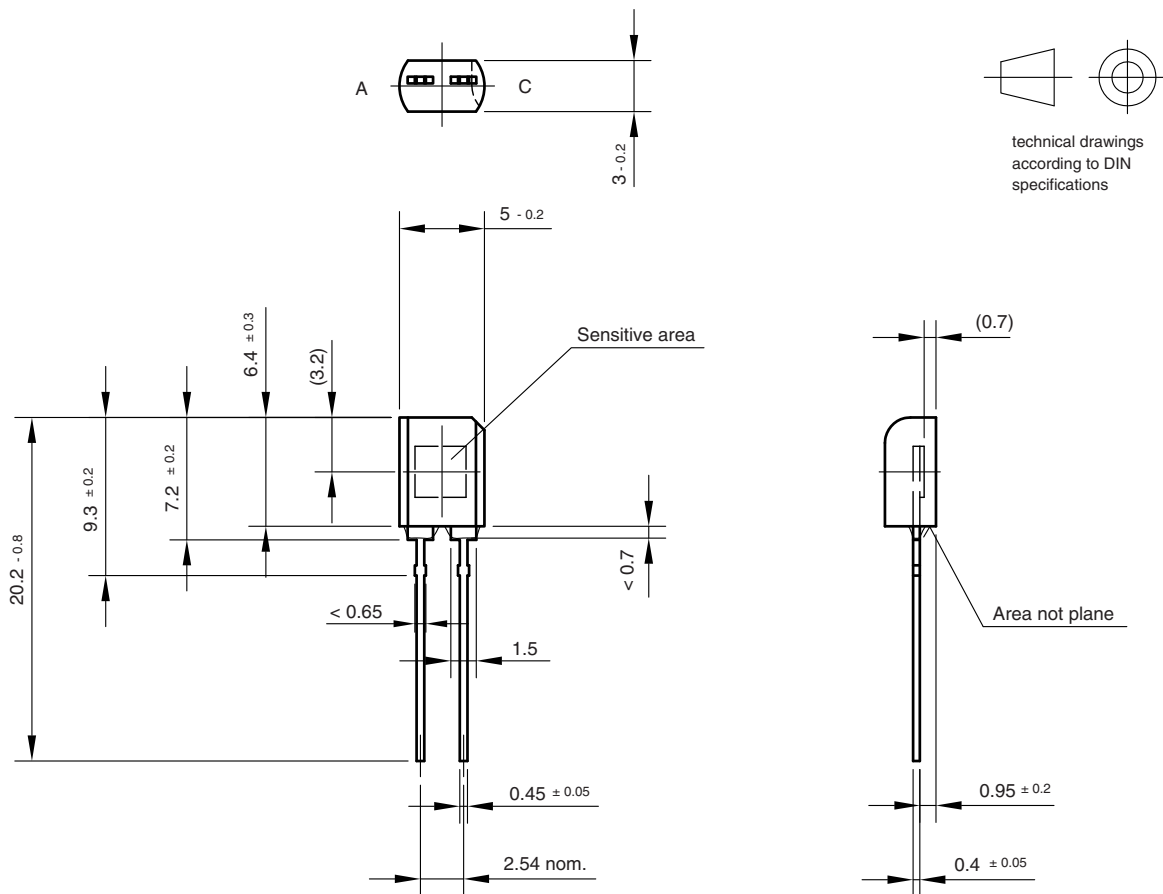


Fig. 8 - Relative Radiant Sensitivity vs. Angular Displacement



**PACKAGE DIMENSIONS** in millimeters



Drawing-No.: 6.544-5109.01-4

Issue:1; 01.07.96

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