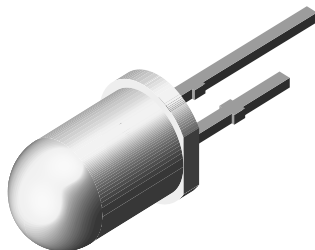


## Silicon PIN Photodiode



94 8390

### DESCRIPTION

BPV10 is a PIN photodiode with high speed and high radiant sensitivity in clear, T-1 $\frac{3}{4}$  plastic package. It is sensitive to visible and near infrared radiation.

### FEATURES

- Package type: leaded
- Package form: T-1 $\frac{3}{4}$
- Dimensions (in mm):  $\varnothing$  5
- Leads with stand-off
- Radiant sensitive area (in mm<sup>2</sup>): 0.78
- High photo sensitivity
- High radiant sensitivity
- Suitable for visible and near infrared radiation
- High bandwidth: 250 MHz at  $V_R = 12$  V
- Fast response times
- Angle of half sensitivity:  $\phi = \pm 20^\circ$
- Compliant to RoHS Directive 2002/95/EC and in accordance with WEEE 2002/96/EC



**RoHS**  
COMPLIANT  
**GREEN**  
(5-2008)\*\*

### Note

\*\* Please see document "Vishay Material Category Policy":  
[www.vishay.com/doc?99902](http://www.vishay.com/doc?99902)

### APPLICATIONS

- High speed photo detector

### PRODUCT SUMMARY

| COMPONENT | $I_{ra}$ ( $\mu$ A) | $\phi$ (deg) | $\lambda_{0.1}$ (nm) |
|-----------|---------------------|--------------|----------------------|
| BPV10     | 70                  | $\pm 20$     | 380 to 1100          |

### Note

- Test condition see table "Basic Characteristics"

### ORDERING INFORMATION

| ORDERING CODE | PACKAGING | REMARKS                      | PACKAGE FORM      |
|---------------|-----------|------------------------------|-------------------|
| BPV10         | Bulk      | MOQ: 4000 pcs, 4000 pcs/bulk | T-1 $\frac{3}{4}$ |

### 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               | $t \leq 5$ s, 2 mm from body                 | $T_{sd}$   | 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                                    |
| Forward voltage                                                                                     | $I_F = 50\text{ mA}$                                                       | $V_F$           |      | 1.0                 | 1.3  | V                                       |
| Breakdown voltage                                                                                   | $I_R = 100\text{ }\mu\text{A}$ , $E = 0$                                   | $V_{(BR)}$      | 60   |                     |      | V                                       |
| Reverse dark current                                                                                | $V_R = 20\text{ V}$ , $E = 0$                                              | $I_{ro}$        |      | 1                   | 5    | nA                                      |
| Diode capacitance                                                                                   | $V_R = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$                          | $C_D$           |      | 11                  |      | pF                                      |
|                                                                                                     | $V_R = 5\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$                          | $C_D$           |      | 3.8                 |      | pF                                      |
| Open circuit voltage                                                                                | $E_A = 1\text{ klx}$                                                       | $V_O$           |      | 480                 |      | mV                                      |
|                                                                                                     | $E_e = 1\text{ mW/cm}^2$ , $\lambda = 950\text{ nm}$                       | $V_O$           |      | 450                 |      | mV                                      |
| Short circuit current                                                                               | $E_A = 1\text{ klx}$                                                       | $I_K$           |      | 80                  |      | $\mu\text{A}$                           |
|                                                                                                     | $E_e = 1\text{ mW/cm}^2$ , $\lambda = 950\text{ nm}$                       | $I_K$           |      | 65                  |      | $\mu\text{A}$                           |
| Reverse light current                                                                               | $E_A = 1\text{ klx}$ , $V_R = 5\text{ V}$                                  | $I_{ra}$        |      | 85                  |      | $\mu\text{A}$                           |
|                                                                                                     | $E_e = 1\text{ mW/cm}^2$ , $\lambda = 950\text{ nm}$ , $V_R = 5\text{ V}$  | $I_{ra}$        | 38   | 70                  |      | $\mu\text{A}$                           |
| Absolute spectral sensitivity                                                                       | $V_R = 5\text{ V}$ , $\lambda = 950\text{ nm}$                             | $s(\lambda)$    |      | 0.55                |      | A/W                                     |
| Angle of half sensitivity                                                                           |                                                                            | $\phi$          |      | $\pm 20$            |      | deg                                     |
| Wavelength of peak sensitivity                                                                      |                                                                            | $\lambda_p$     |      | 920                 |      | nm                                      |
| Range of spectral bandwidth                                                                         |                                                                            | $\lambda_{0.1}$ |      | 380 to 1100         |      | nm                                      |
| Quantum efficiency                                                                                  | $\lambda = 950\text{ nm}$                                                  | $\eta$          |      | 72                  |      | %                                       |
| Noise equivalent power                                                                              | $V_R = 20\text{ V}$ , $\lambda = 950\text{ nm}$                            | NEP             |      | $3 \times 10^{-14}$ |      | $\text{W}/\sqrt{\text{Hz}}$             |
| Detectivity                                                                                         | $V_R = 20\text{ V}$ , $\lambda = 950\text{ nm}$                            | D               |      | $3 \times 10^{12}$  |      | $\text{cm}^2/\sqrt{\text{Hz}}/\text{W}$ |
| Rise time                                                                                           | $V_R = 50\text{ V}$ , $R_L = 50\text{ }\Omega$ , $\lambda = 820\text{ nm}$ | $t_r$           |      | 2.5                 |      | ns                                      |
| Fall time                                                                                           | $V_R = 50\text{ V}$ , $R_L = 50\text{ }\Omega$ , $\lambda = 820\text{ nm}$ | $t_f$           |      | 2.5                 |      | ns                                      |

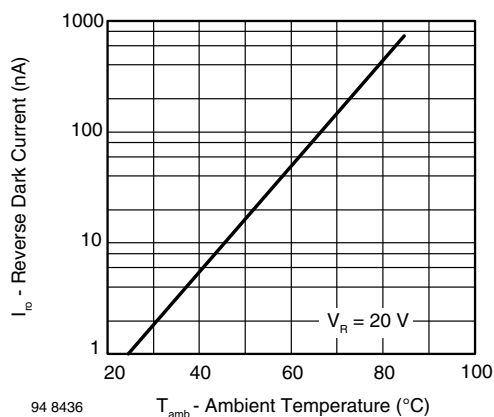
**BASIC CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

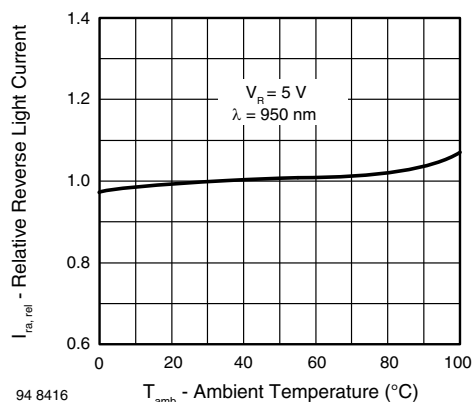


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

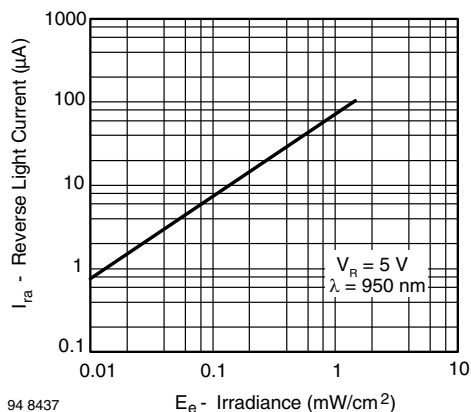


Fig. 3 - Reverse Light Current vs. Irradiance

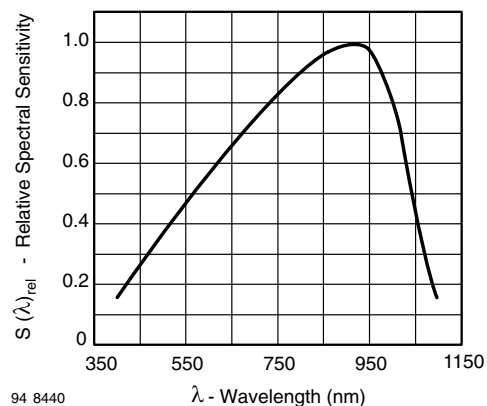


Fig. 6 - Relative Spectral Sensitivity vs. Wavelength

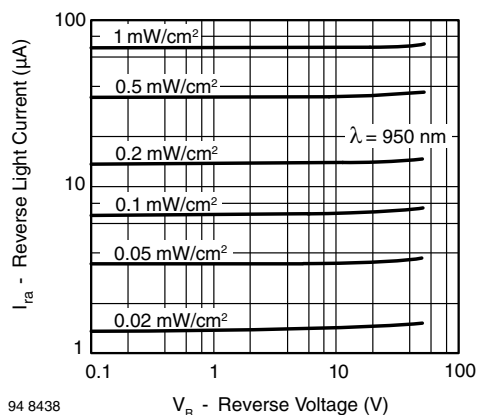


Fig. 4 - Reverse Light Current vs. Reverse Voltage

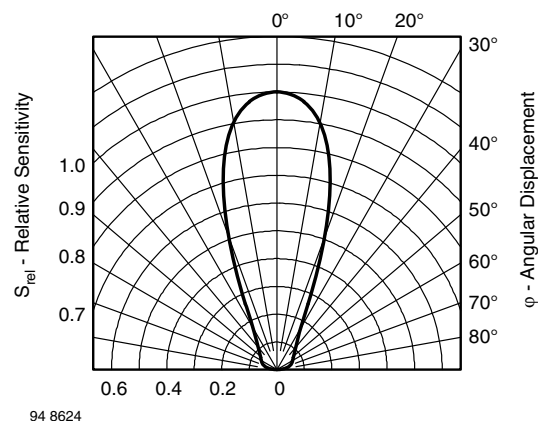


Fig. 7 - Relative Radiant Sensitivity vs. Angular Displacement

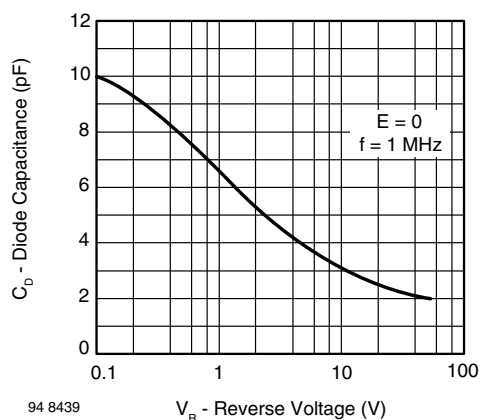
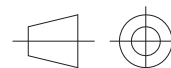
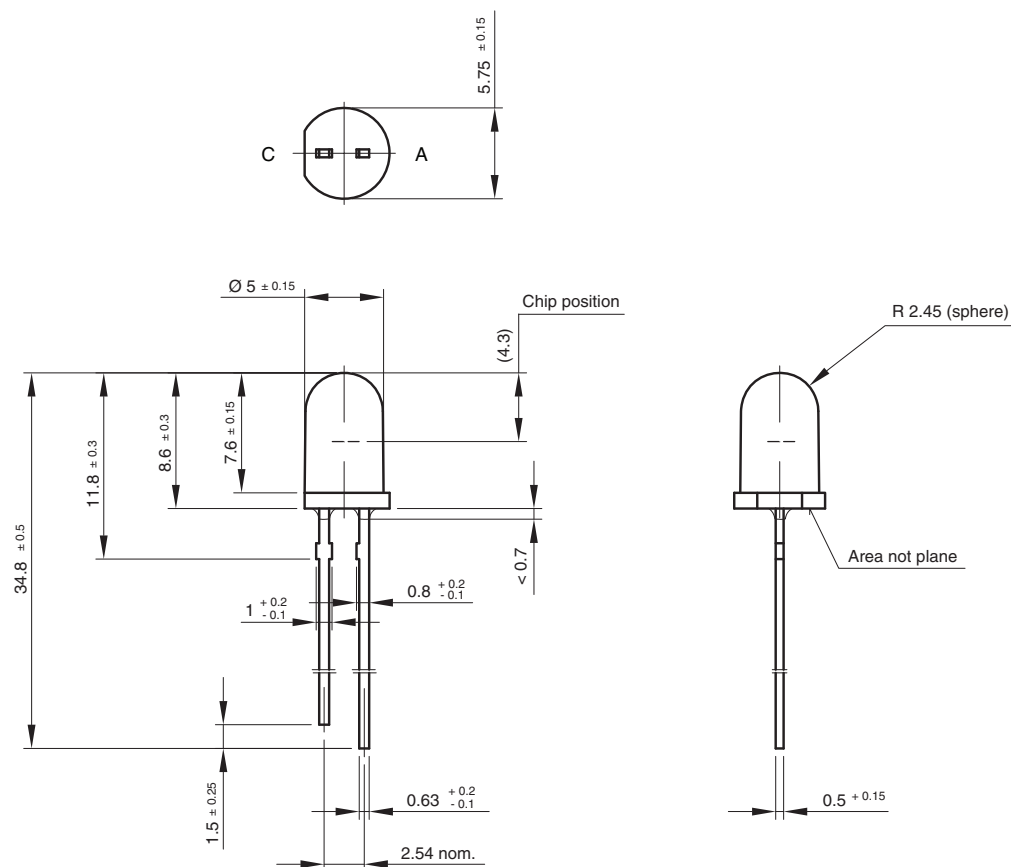


Fig. 5 - Diode Capacitance vs. Reverse Voltage

**PACKAGE DIMENSIONS** in millimeters


technical drawings  
according to DIN  
specifications

Drawing-No.: 6.544-5185.02-4

Issue:1; 01.07.96

96 12199



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