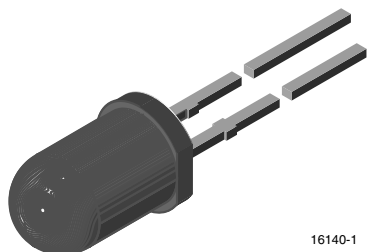


## Silicon PIN Photodiode, RoHS Compliant



### DESCRIPTION

BPV10NF is a PIN photodiode with high speed and high radiant sensitivity in black, T-1 $\frac{3}{4}$  plastic package with daylight blocking filter. Filter bandwidth is matched with 870 nm to 950 nm IR emitters.

### 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 radiant sensitivity
- Daylight blocking filter matched with 870 nm to 950 nm emitters
- High bandwidth: > 100 MHz at  $V_R = 12$  V
- Fast response times
- Angle of half sensitivity:  $\varphi = \pm 20^\circ$
- Lead (Pb)-free component in accordance with RoHS 2002/95/EC and WEEE 2002/96/EC



**RoHS**  
COMPLIANT

### APPLICATIONS

- High speed detector for infrared radiation
- Infrared remote control and free air data transmission systems, e.g. in combination with TSFFxxxx series IR emitters

### PRODUCT SUMMARY

| COMPONENT | $I_{ra}$ (mA) | $\varphi$ (deg) | $\lambda_{0.5}$ (nm) |
|-----------|---------------|-----------------|----------------------|
| BPV10NF   | 60            | $\pm 20$        | 790 to 1050          |

#### Note

Test condition see table "Basic Characteristics"

### ORDERING INFORMATION

| ORDERING CODE | PACKAGING | REMARKS                      | PACKAGE FORM      |
|---------------|-----------|------------------------------|-------------------|
| BPV10NF       | Bulk      | MOQ: 4000 pcs, 4000 pcs/bulk | T-1 $\frac{3}{4}$ |

#### Note

MOQ: minimum order quantity

### ABSOLUTE MAXIMUM RATINGS

| 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              |

#### Note

$T_{amb} = 25^\circ\text{C}$ , unless otherwise specified



| BASIC CHARACTERISTICS               |                                                                                 |                 |      |                     |      |                           |
|-------------------------------------|---------------------------------------------------------------------------------|-----------------|------|---------------------|------|---------------------------|
| 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                        |
| Open circuit voltage                | $E_o = 1 \text{ mW/cm}^2$ , $\lambda = 870 \text{ nm}$                          | $V_O$           |      | 450                 |      | mV                        |
| Short circuit current               | $E_o = 1 \text{ mW/cm}^2$ , $\lambda = 870 \text{ nm}$                          | $I_K$           |      | 50                  |      | $\mu\text{A}$             |
| Reverse light current               | $E_o = 1 \text{ mW/cm}^2$ , $\lambda = 870 \text{ nm}$ ,<br>$V_R = 5 \text{ V}$ | $I_{ra}$        |      | 55                  |      | $\mu\text{A}$             |
|                                     | $E_o = 1 \text{ mW/cm}^2$ , $\lambda = 950 \text{ nm}$ ,<br>$V_R = 5 \text{ V}$ | $I_{ra}$        | 30   | 60                  |      | $\mu\text{A}$             |
| Temperature coefficient of $I_{ra}$ | $E_o = 1 \text{ mW/cm}^2$ , $\lambda = 870 \text{ nm}$ ,<br>$V_R = 5 \text{ V}$ | $TK_{Ira}$      |      | - 0.1               |      | %/K                       |
| Absolute spectral sensitivity       | $V_R = 5 \text{ V}$ , $\lambda = 870 \text{ nm}$                                | $s(\lambda)$    |      | 0.55                |      | A/W                       |
| Angle of half sensitivity           |                                                                                 | $\varphi$       |      | $\pm 20$            |      | deg                       |
| Wavelength of peak sensitivity      |                                                                                 | $\lambda_p$     |      | 940                 |      | nm                        |
| Range of spectral bandwidth         |                                                                                 | $\lambda_{0.5}$ |      | 790 to 1050         |      | nm                        |
| Quantum efficiency                  | $\lambda = 950 \text{ nm}$                                                      | $\eta$          |      | 70                  |      | %                         |
| Noise equivalent power              | $V_R = 20 \text{ V}$ , $\lambda = 950 \text{ nm}$                               | NEP             |      | $3 \times 10^{-14}$ |      | W/ $\sqrt{\text{Hz}}$     |
| Detectivity                         | $V_R = 20 \text{ V}$ , $\lambda = 950 \text{ nm}$                               | $D^*$           |      | $3 \times 10^{12}$  |      | $\text{cm}^2/\text{Hz/W}$ |
| 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                        |

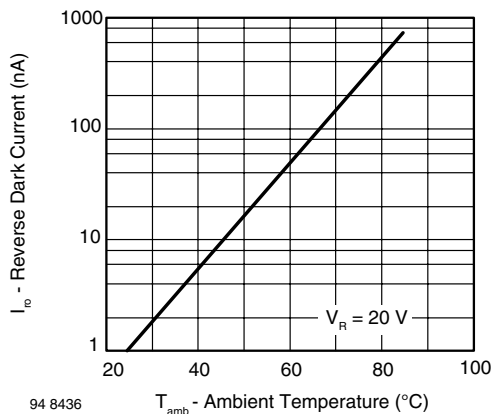
**Note** $T_{amb} = 25 \text{ }^\circ\text{C}$ , unless otherwise specified**BASIC CHARACTERISTICS** $T_{amb} = 25 \text{ }^\circ\text{C}$ , unless otherwise specified

Fig. 1 - Reverse Dark Current vs. Ambient Temperature

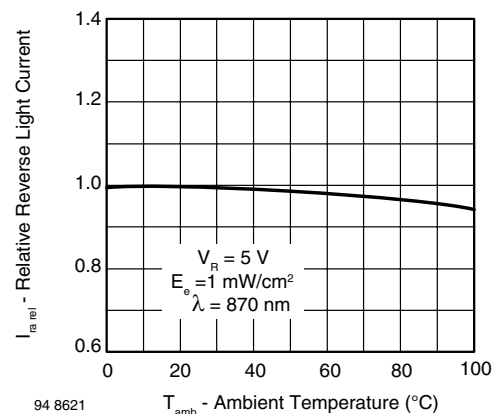


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

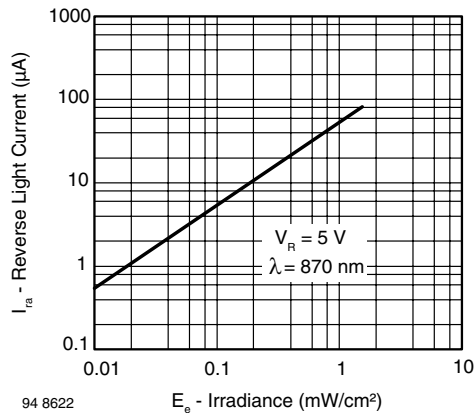


Fig. 3 - Reverse Light Current vs. Irradiance

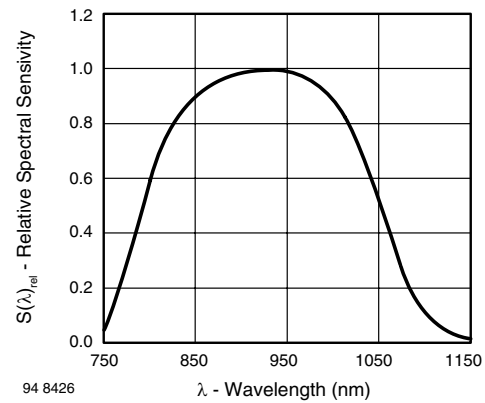


Fig. 6 - Relative Spectral Sensitivity vs. Wavelength

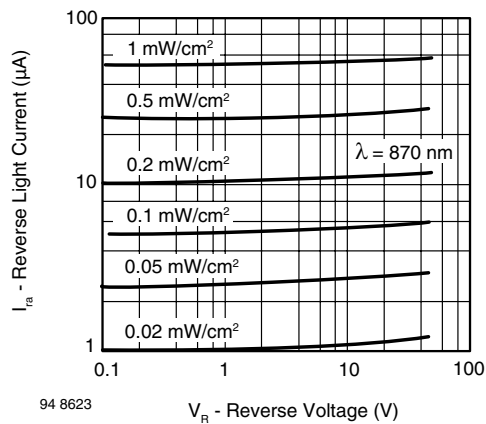


Fig. 4 - Reverse Light Current vs. Reverse Voltage

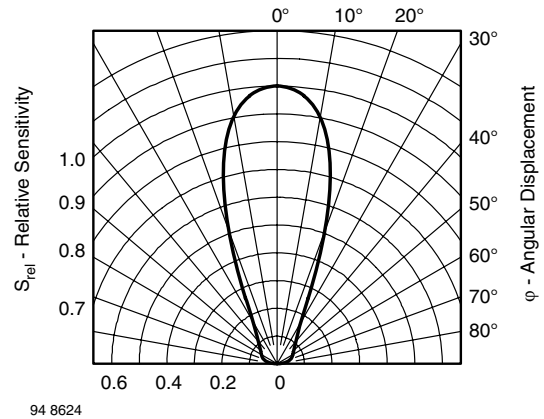


Fig. 7 - Relative Radiant Sensitivity vs. Angular Displacement

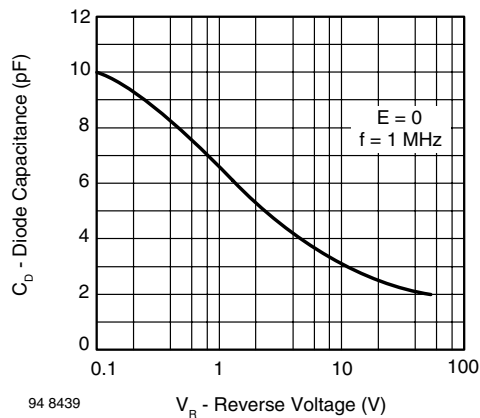
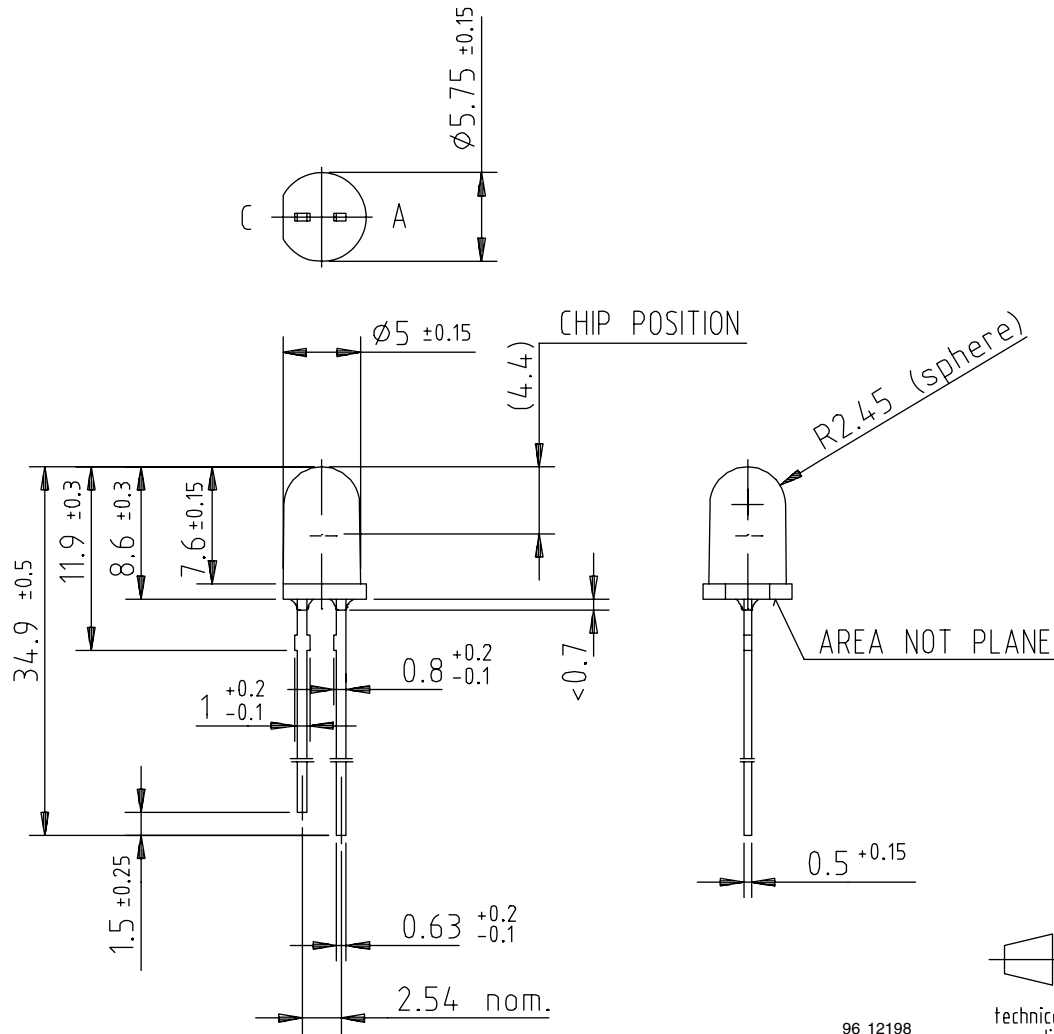
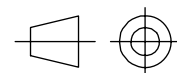


Fig. 5 - Diode Capacitance vs. Reverse Voltage

**PACKAGE DIMENSIONS** in millimeters

96 12198

technical drawings  
according to DIN  
specifications



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