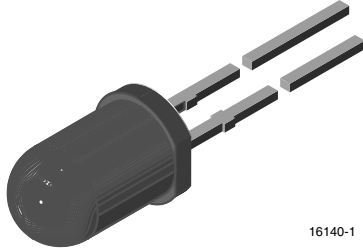


Silicon PIN Photodiode



16140-1

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
- Radiant sensitive area (in mm²): 0.78
- Leads with stand-off
- 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: $\varphi = \pm 20^\circ$
- Compliant to RoHS Directive 2002/95/EC and in accordance with 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} (μ A) | φ (deg) | $\lambda_{0.5}$ (nm) |
|-----------|---------------------|-----------------|----------------------|
| BPV10NF | 60 | ± 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 ($T_{amb} = 25$ °C, unless otherwise specified)

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

| BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, 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 |
| Open circuit voltage | $E_e = 1\text{ mW/cm}^2$, $\lambda = 870\text{ nm}$ | V_O | | 450 | | mV |
| Short circuit current | $E_e = 1\text{ mW/cm}^2$, $\lambda = 870\text{ nm}$ | I_K | | 50 | | μA |
| Reverse light current | $E_e = 1\text{ mW/cm}^2$, $\lambda = 870\text{ nm}$, $V_R = 5\text{ V}$ | I_{ra} | | 55 | | μA |
| | $E_e = 1\text{ mW/cm}^2$, $\lambda = 950\text{ nm}$, $V_R = 5\text{ V}$ | I_{ra} | 30 | 60 | | μA |
| Temperature coefficient of I_{ra} | $E_e = 1\text{ mW/cm}^2$, $\lambda = 870\text{ nm}$, $V_R = 5\text{ V}$ | $TK_{I_{ra}}$ | | - 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 | | φ | | ± 20 | | deg |
| Wavelength of peak sensitivity | | λ_p | | 940 | | nm |
| Range of spectral bandwidth | | $\lambda_{0.5}$ | | 790 to 1050 | | nm |
| Quantum efficiency | $\lambda = 950\text{ nm}$ | η | | 70 | | % |
| Noise equivalent power | $V_R = 20\text{ V}$, $\lambda = 950\text{ nm}$ | NEP | | 3×10^{-14} | | $\text{W}/\sqrt{\text{Hz}}$ |
| Detectivity | $V_R = 20\text{ V}$, $\lambda = 950\text{ nm}$ | D^* | | 3×10^{12} | | $\text{cm}\sqrt{\text{Hz}}/\text{W}$ |
| 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 |

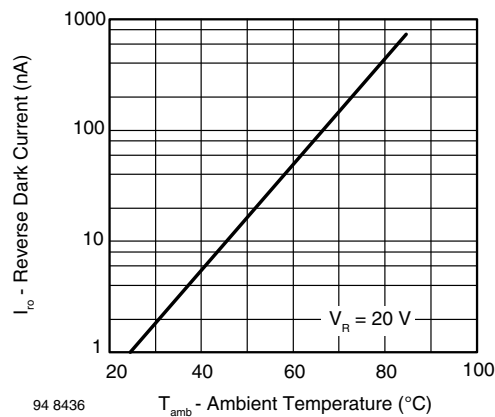
BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

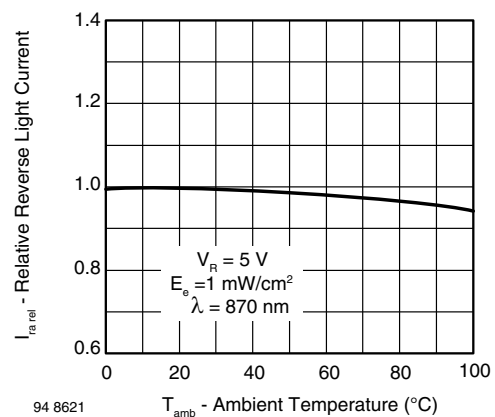


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

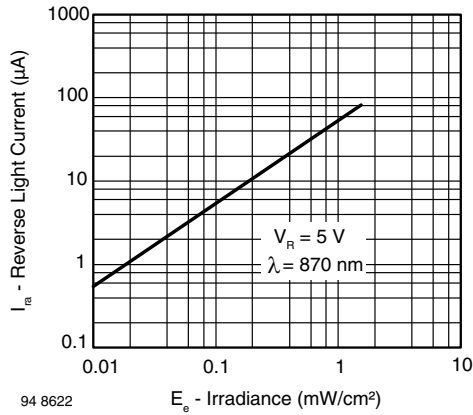


Fig. 3 - Reverse Light Current vs. Irradiance

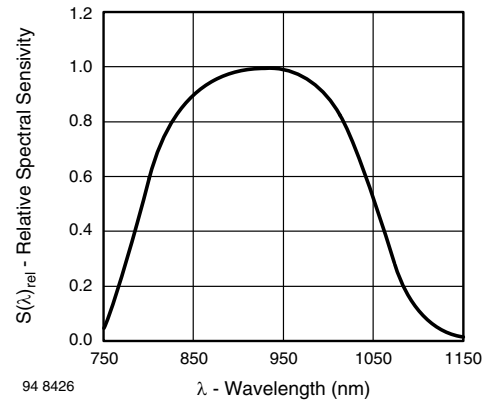


Fig. 6 - Relative Spectral Sensitivity vs. Wavelength

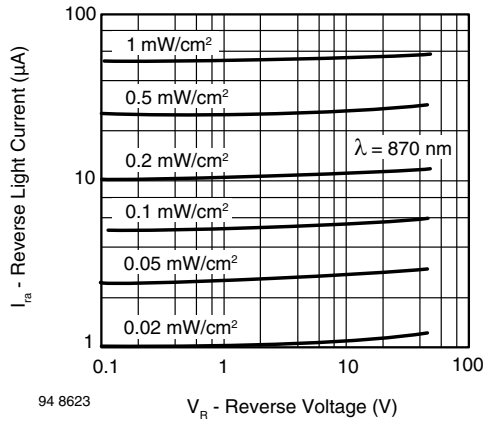


Fig. 4 - Reverse Light Current vs. Reverse Voltage

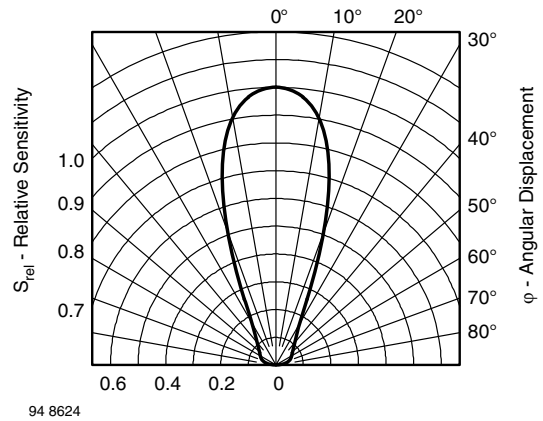


Fig. 7 - Relative Radiant Sensitivity vs. Angular Displacement

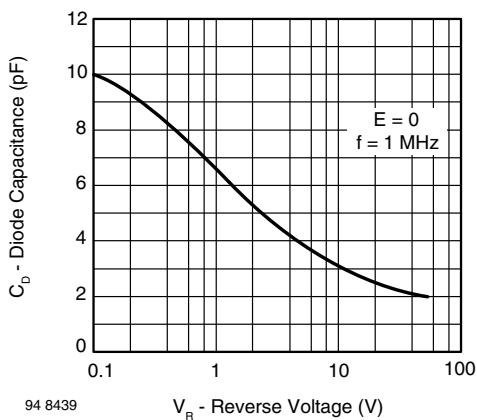
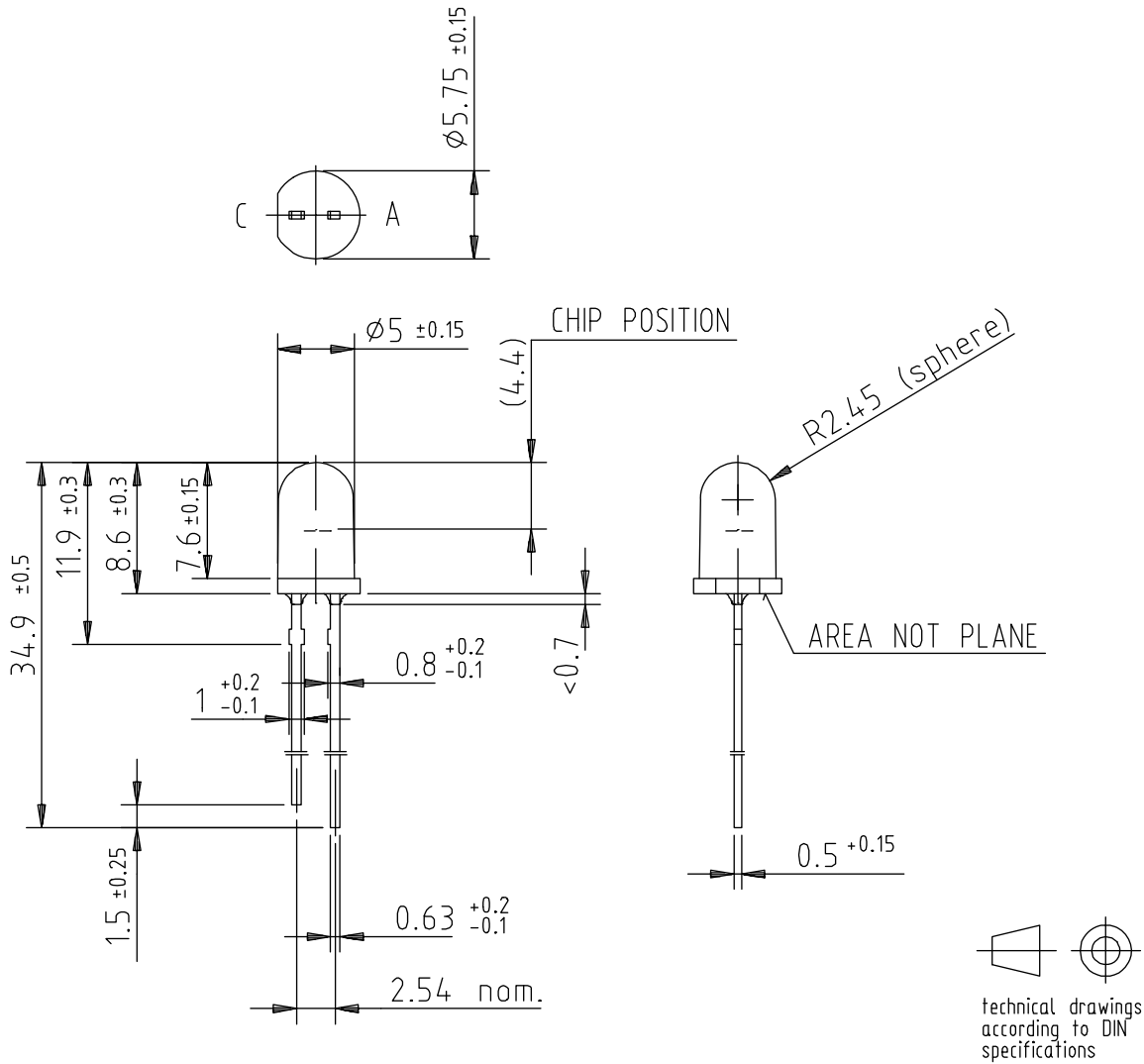


Fig. 5 - Diode Capacitance vs. Reverse Voltage



PACKAGE DIMENSIONS in millimeters



Drawing-No.: 6.544-5185.01-4

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