

Silicon PIN Photodiode



FEATURES

- Package type: leaded
- Package form: side view
- Dimensions (in mm): 4.5 x 5 x 6
- Radiant sensitive area (in mm²): 7.5
- High radiant sensitivity
- Daylight blocking filter matched with 940 nm emitters
- Fast response times
- Angle of half sensitivity: $\phi = \pm 60^\circ$
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC



Note

** Please see document "Vishay Material Category Policy":
www.vishay.com/doc?99902

APPLICATIONS

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

DESCRIPTION

BPV22F is a PIN photodiode with high speed and high radiant sensitivity in a black, plastic package with side view lens and daylight blocking filter. Filter bandwidth is matched with 900 nm to 950 nm IR emitters. The lens achieves 80 % of sensitivity improvement in comparison with flat package.

PRODUCT SUMMARY

| COMPONENT | I_{ra} (μA) | ϕ (deg) | $\lambda_{0.5}$ (nm) |
|-----------|----------------------|--------------|----------------------|
| BPV22F | 80 | ± 60 | 870 to 1050 |

Note

- Test condition see table "Basic Characteristics"

ORDERING INFORMATION

| ORDERING CODE | PACKAGING | REMARKS | PACKAGE FORM |
|---------------|-----------|------------------------------|--------------|
| BPV22F | Bulk | MOQ: 4000 pcs, 4000 pcs/bulk | Side view |

Note

- MOQ: minimum order quantity

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

| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT |
|-------------------------------------|--|------------|---------------|------------|
| Reverse voltage | | V_R | 60 | V |
| Power dissipation | $T_{amb} \leq 25^\circ C$ | P_V | 215 | mW |
| Junction temperature | | T_j | 100 | $^\circ C$ |
| Operating temperature range | | T_{amb} | - 40 to + 100 | $^\circ C$ |
| Storage temperature range | | T_{stg} | - 40 to + 100 | $^\circ C$ |
| Soldering temperature | $t \leq 5$ s | T_{sd} | 260 | $^\circ C$ |
| 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 | 1.3 | V |
| 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 |
| Serial resistance | $V_R = 12\text{ V}$, $f = 1\text{ MHz}$ | R_S | | 400 | | Ω |
| Open circuit voltage | $E_e = 1\text{ mW/cm}^2$, $\lambda = 950\text{ nm}$ | V_o | | 370 | | 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 | $E_e = 1\text{ mW/cm}^2$, $\lambda = 950\text{ nm}$ | I_k | | 75 | | μA |
| Reverse light current | $E_e = 1\text{ mW/cm}^2$, $\lambda = 950\text{ nm}$, $V_R = 5\text{ V}$ | I_{ra} | 55 | 80 | | μA |
| Temperature coefficient of I_{ra} | $E_e = 1\text{ mW/cm}^2$, $\lambda = 950\text{ nm}$, $V_R = 10\text{ V}$ | $TK_{I_{ra}}$ | | 0.1 | | %/K |
| Absolute spectral sensitivity | $V_R = 5\text{ V}$, $\lambda = 870\text{ nm}$ | $s(\lambda)$ | | 0.35 | | A/W |
| | $V_R = 5\text{ V}$, $\lambda = 950\text{ nm}$ | $s(\lambda)$ | | 0.6 | | A/W |
| Angle of half sensitivity | | ϕ | | ± 60 | | deg |
| Wavelength of peak sensitivity | | λ_p | | 950 | | nm |
| Range of spectral bandwidth | | $\lambda_{0.5}$ | | 870 to 1050 | | nm |
| Quantum efficiency | $\lambda = 950\text{ nm}$ | η | | 90 | | % |
| Noise equivalent power | $V_R = 10\text{ V}$, $\lambda = 950\text{ nm}$ | NEP | | 4×10^{-14} | | $\text{W}/\sqrt{\text{Hz}}$ |
| Detectivity | $V_R = 10\text{ V}$, $\lambda = 950\text{ nm}$ | D^* | | 6×10^{12} | | $\text{cm}\sqrt{\text{Hz/W}}$ |
| 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 |
| Cut-off frequency | $V_R = 12\text{ V}$, $R_L = 1\text{ k}\Omega$, $\lambda = 870\text{ nm}$ | f_c | | 4 | | MHz |
| | $V_R = 12\text{ V}$, $R_L = 1\text{ k}\Omega$, $\lambda = 950\text{ nm}$ | f_c | | 1 | | MHz |

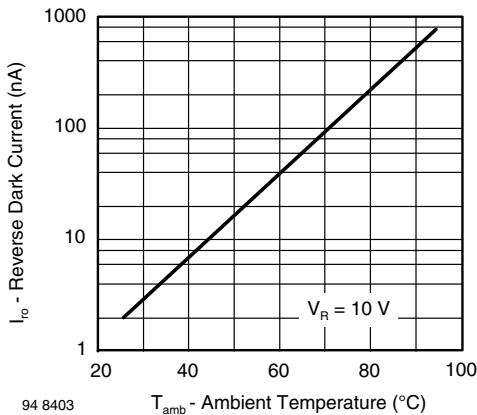
BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

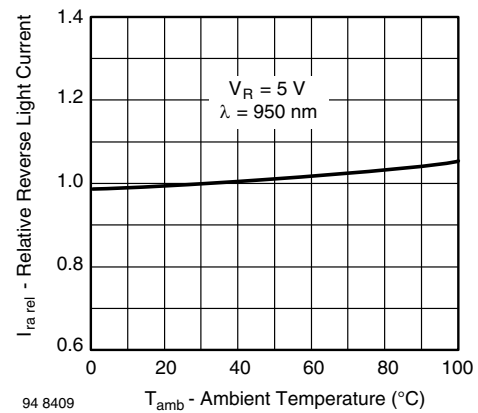


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature



Fig. 3 - Reverse Light Current vs. Irradiance



Fig. 6 - Relative Spectral Sensitivity vs. Wavelength

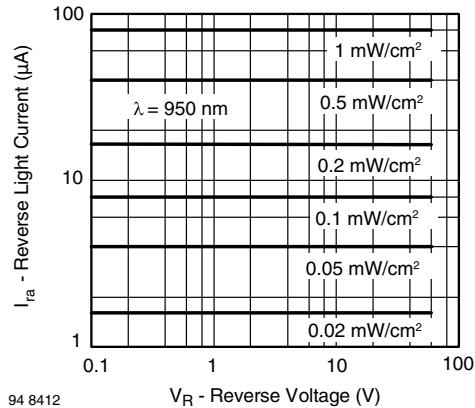


Fig. 4 - Reverse Light Current vs. Reverse Voltage



Fig. 7 - Relative Radiant Sensitivity vs. Angular Displacement

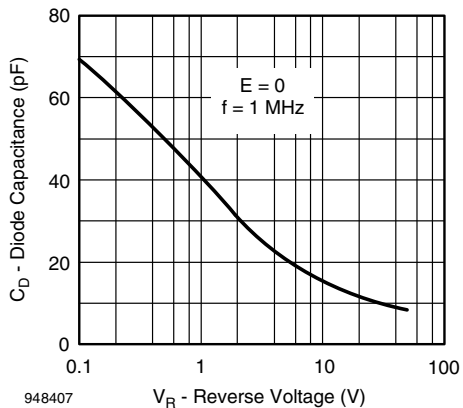
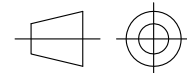
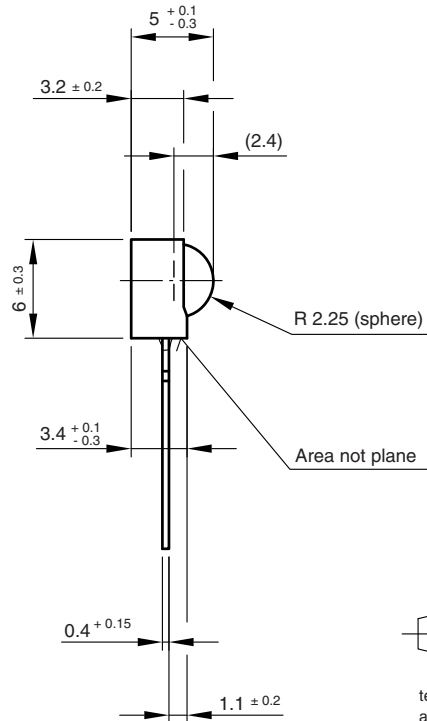
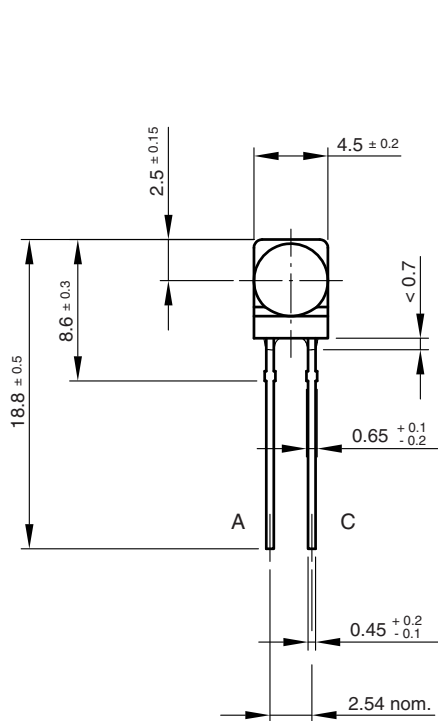


Fig. 5 - Diode Capacitance vs. Reverse Voltage



PACKAGE DIMENSIONS in millimeters



technical drawings according to DIN specifications

Drawing-No.: 6.544-5199.01-4
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