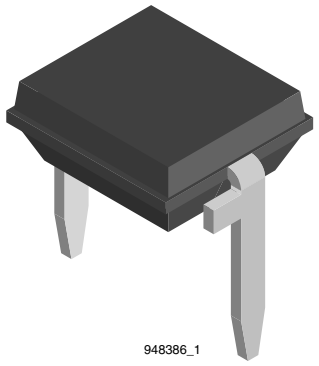
# Silicon PIN Photodiode




## FEATURES

- Package type: leaded
- Package form: top view
- Dimensions (in mm): 5.4 x 4.3 x 3.2
- Radiant sensitive area (in $mm^2$): 7.5
- High radiant sensitivity
- Daylight blocking filter matched with 940 nm emitters
- Fast response times
- Angle of half sensitivity: φ = ± 65°
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Pb-free

e3

RoHS COMPLIANT

GREEN (5-2008)**

**Note**

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

## DESCRIPTION

BP104 is a PIN photodiode with high speed and high radiant sensitivity in miniature, flat, top view plastic package with daylight blocking filter. Filter bandwidth is matched with 900 nm to 950 nm IR emitters.
BP104S is packed in tubes, specifications like BP104.

## 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

| PRODUCT SUMMARY | | | |
|---|---|---|---|
| COMPONENT | $I_{ra}$ (µA) | φ (deg) | $\lambda_{0.5}$ (nm) |
| BP104 | 45 | ± 65 | 870 to 1050 |
| BP104S | 45 | ± 65 | 870 to 1050 |

**Note**

- Test condition see table “Basic Characteristics”

| ORDERING INFORMATION | | | |
|---|---|---|---|
| ORDERING CODE | PACKAGING | REMARKS | PACKAGE FORM |
| BP104 | Bulk | MOQ: 3000 pcs, 3000 pcs/bulk | Top view |
| BP104S | Tube | MOQ: 1800 pcs, 45 pcs/tube | Top view |

**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 ≤ 3 s | $T_{sd}$ | 260 | °C |
| Thermal resistance junction/ambient | Connected with Cu wire, 0.14 $mm^2$ | $R_{thJA}$ | 350 | K/W |

| **BASIC CHARACTERISTICS** ($T_{amb}$ = 25 °C, unless otherwise specified) | | | | | | |
|---|---|---|---|---|---|---|
| **PARAMETER** | **TEST CONDITION** | **SYMBOL** | **MIN.** | **TYP.** | **MAX.** | **UNIT** |
| Breakdown voltage | $I_R$ = 100 µA, E = 0 | $V_{(BR)}$ | 60 | | | V |
| Reverse dark current | $V_R$ = 10 V, E = 0 | $I_{ro}$ | | 2 | 30 | nA |
| Diode capacitance | $V_R$= 0 V, f = 1 MHz, E = 0 | $C_D$ | | 70 | | pF |
| | $V_R$= 3 V, f = 1 MHz, E = 0 | $C_D$ | | 25 | 40 | pF |
| Open circuit Voltage | $E_e$ = 1 mW/cm², λ = 950 nm | $V_o$ | | 350 | | mV |
| Short circuit current | $E_e$ = 1 mW/cm², λ = 950 nm | $I_k$ | | 38 | | µA |
| Reverse light current | $E_e$ = 1 mW/cm², λ = 950 nm, $V_R$ = 5 V | $I_{ra}$ | 40 | 45 | | µA |
| Angle of half sensitivity | | φ | | ± 65 | | deg |
| Wavelength of peak sensitivity | | $\lambda_p$ | | 950 | | nm |
| Range of spectral bandwidth | | $\lambda_{0.5}$ | | 870 to 1050 | | nm |
| Noise equivalent power | $V_R$ = 10 V, λ = 950 nm | NEP | | 4 x $10^{-14}$ | | W/√ Hz |
| Rise time | $V_R$ = 10 V, $R_L$ = 1 kΩ, λ = 820 nm | $t_r$ | | 100 | | ns |
| Fall time | $V_R$ = 10 V, $R_L$ = 1 kΩ, λ = 820 nm | $t_f$ | | 100 | | ns |

## BASIC CHARACTERISTICS ($T_{amb}$ = 25 °C, unless otherwise specified)

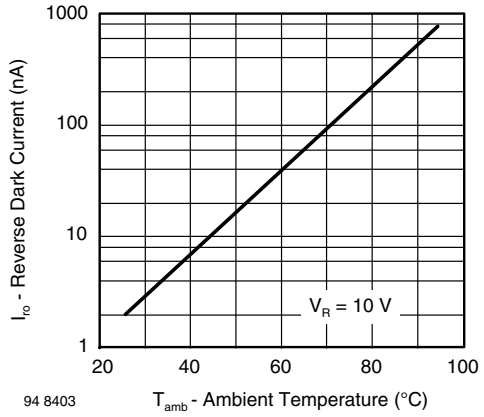



Fig. 1 - Reverse Dark Current vs. Ambient Temperature

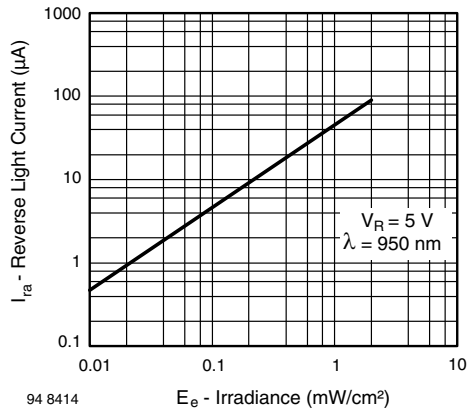



Fig. 3 - Reverse Light Current vs. Irradiance

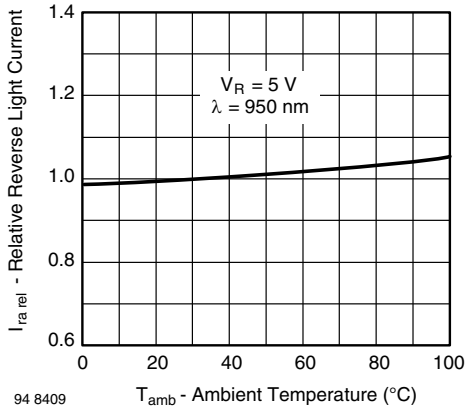



Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

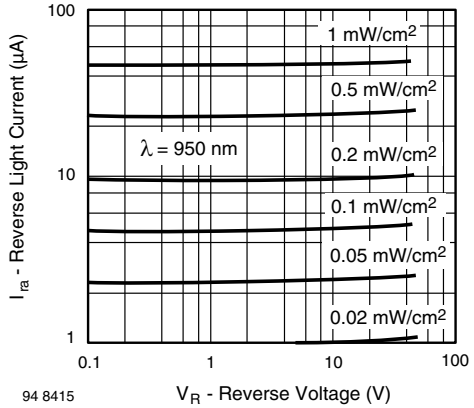



Fig. 4 - Reverse Light Current vs. Reverse Voltage

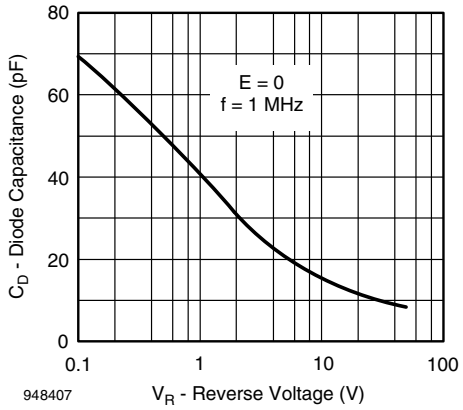



Fig. 5 - Diode Capacitance vs. Reverse Voltage

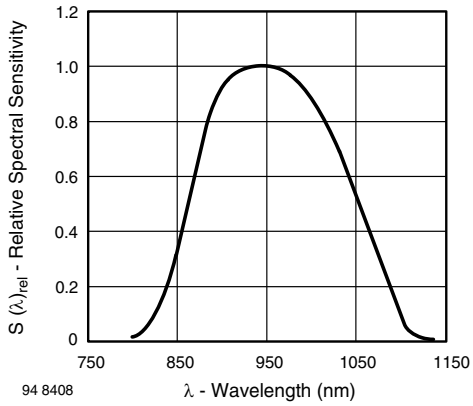



Fig. 6 - Relative Spectral Sensitivity vs. Wavelength

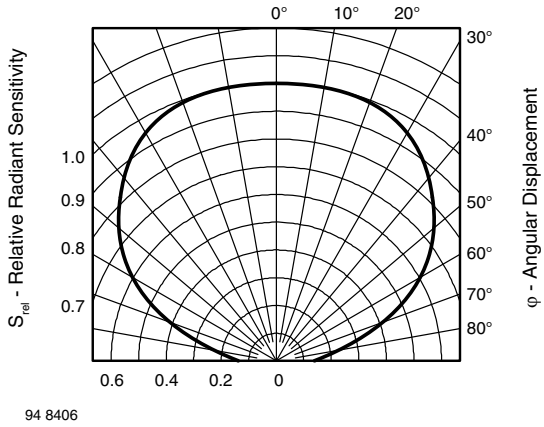
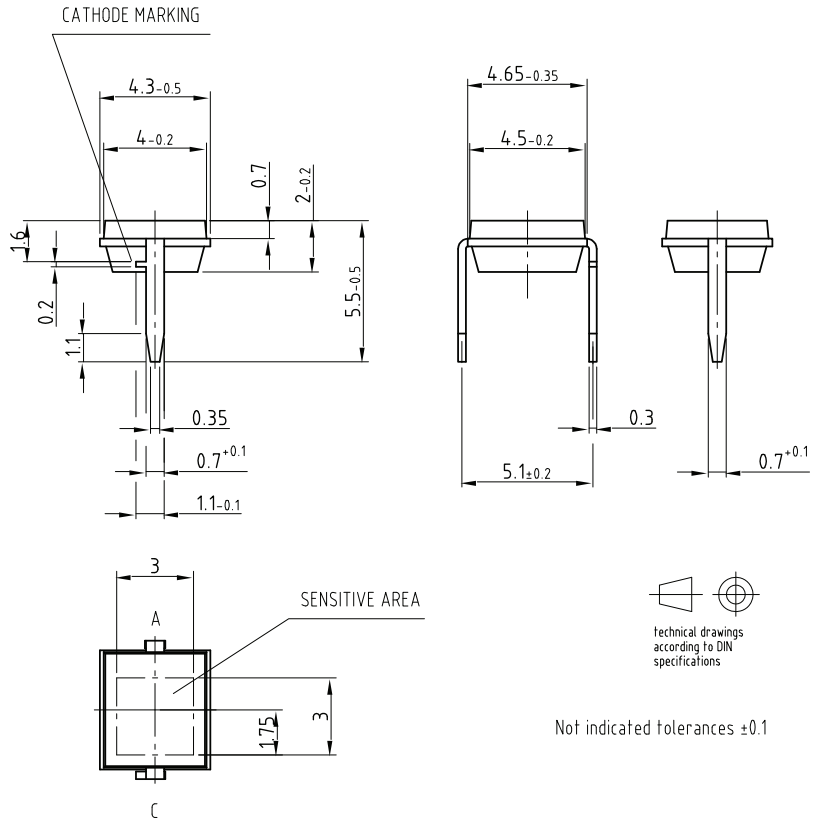



Fig. 7 - Relative Radiant Sensitivity vs. Angular Displacement

## PACKAGE DIMENSIONS in millimeters

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## TUBE PACKAGING DIMENSIONS in millimeters

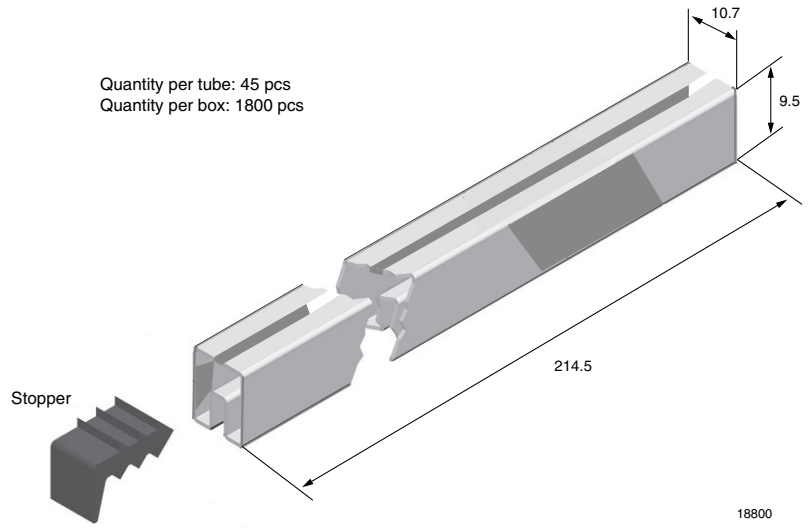


Fig. 8 - Drawing Proportions not scaled

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