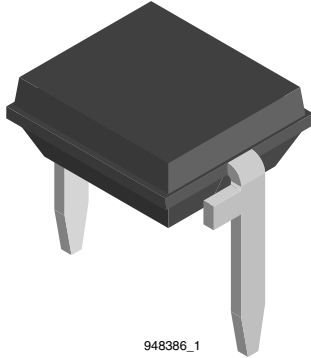


## Silicon PIN Photodiode



### 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.

### FEATURES

- Package type: leaded
- Package form: top view
- Dimensions (in mm): 5.4 x 4.3 x 3.2
- Radiant sensitive area (in mm<sup>2</sup>): 7.5
- High radiant sensitivity
- Daylight blocking filter matched with 940 nm emitters
- Fast response times
- Angle of half sensitivity:  $\phi = \pm 65^\circ$
- 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](http://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

PRODUCT SUMMARY			
COMPONENT	$I_{ra}$ ( $\mu A$ )	$\phi$ (deg)	$\lambda_{0.5}$ (nm)
BP104	45	$\pm 65$	870 to 1050
BP104S	45	$\pm 65$	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 ( $T_{amb} = 25^\circ C$ , 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	$t \leq 3$ s	$T_{sd}$	260	$^\circ C$
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
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
	$V_R = 3\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$	$C_D$		25	40	pF
Open circuit Voltage	$E_e = 1\text{ mW/cm}^2$ , $\lambda = 950\text{ nm}$	$V_o$		350		mV
Short circuit current	$E_e = 1\text{ mW/cm}^2$ , $\lambda = 950\text{ nm}$	$I_k$		38		$\mu\text{A}$
Reverse light current	$E_e = 1\text{ mW/cm}^2$ , $\lambda = 950\text{ nm}$ , $V_R = 5\text{ V}$	$I_{ra}$	40	45		$\mu\text{A}$
Angle of half sensitivity		$\phi$		$\pm 65$		deg
Wavelength of peak sensitivity		$\lambda_p$		950		nm
Range of spectral bandwidth		$\lambda_{0.5}$		870 to 1050		nm
Noise equivalent power	$V_R = 10\text{ V}$ , $\lambda = 950\text{ nm}$	NEP		$4 \times 10^{-14}$		$\text{W}/\sqrt{\text{Hz}}$
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

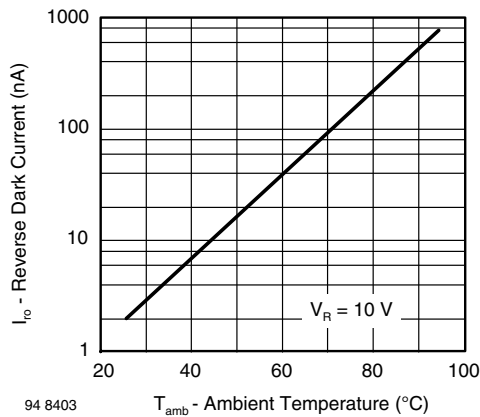
**BASIC CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)


Fig. 1 - Reverse Dark Current vs. Ambient Temperature



Fig. 3 - Reverse Light Current vs. Irradiance



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

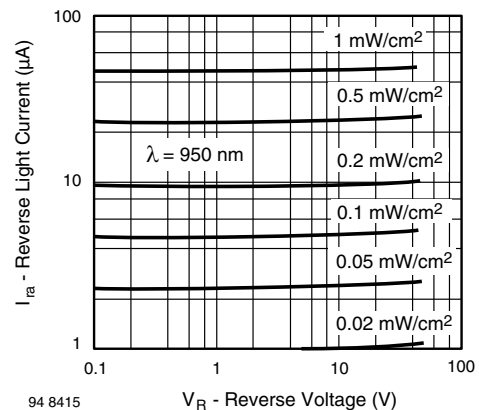


Fig. 4 - Reverse Light Current vs. Reverse Voltage

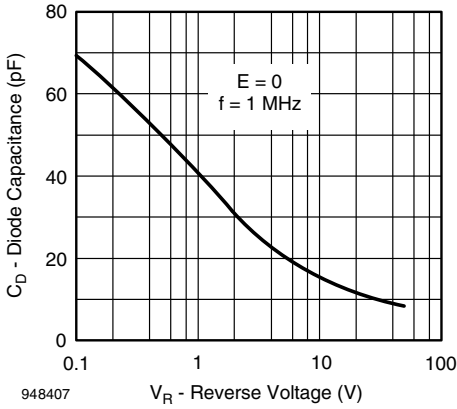


Fig. 5 - Diode Capacitance vs. Reverse Voltage

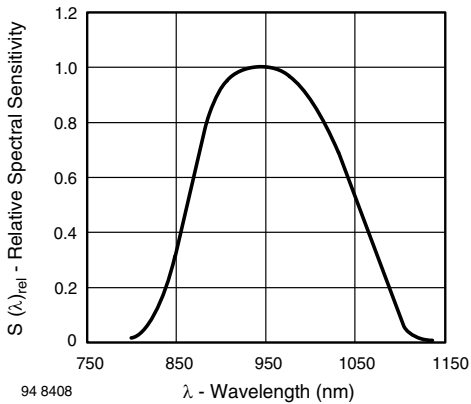


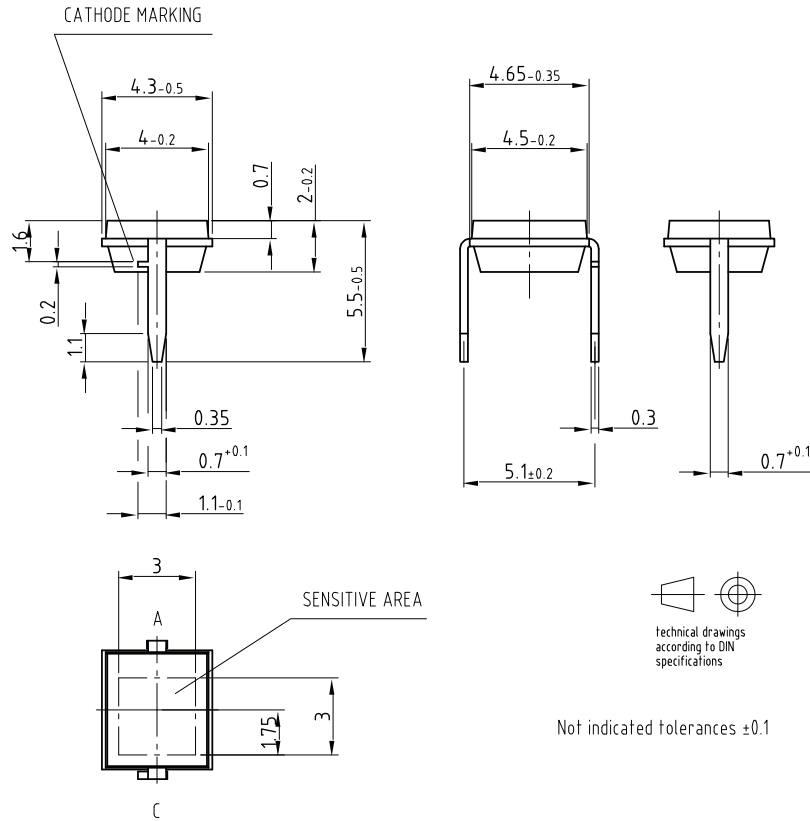
Fig. 6 - Relative Spectral Sensitivity vs. Wavelength



Fig. 7 - Relative Radiant Sensitivity vs. Angular Displacement



**PACKAGE DIMENSIONS** in millimeters



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**TUBE PACKAGING DIMENSIONS** in millimeters

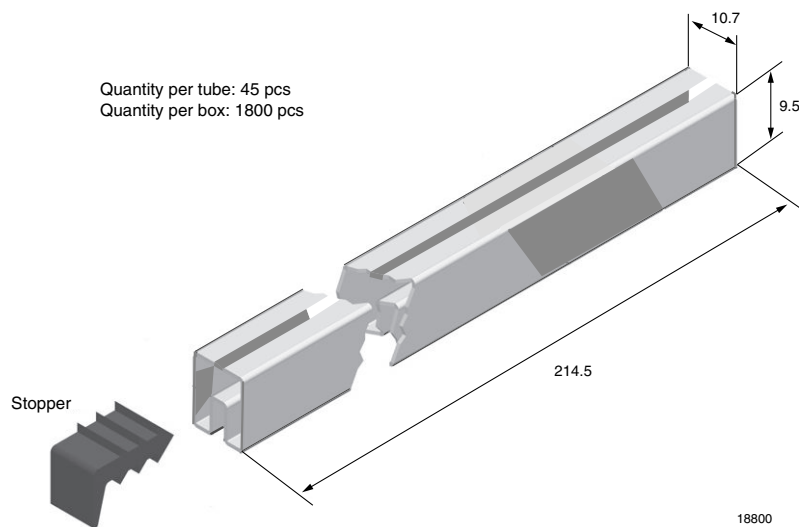


Fig. 8 - Drawing Proportions not scaled



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