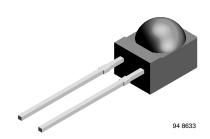
GREEN (5-2008)\*\*



### Vishay Semiconductors

### Silicon PIN Photodiode

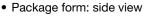


## DESCRIPTION

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 bandwdith is matched with 900 nm to 950 nm IR emitters. The lens achieves 80 % of sensitivity improvement in comparison with flat package.

#### **FEATURES**

Package type: leaded



• Dimensions (in mm): 4.5 x 5 x 6

• Radiant sensitive area (in mm<sup>2</sup>): 7.5

• High radiant sensitivity

Daylight blocking filter matched with 940 nm emitters



• Angle of half sensitivity:  $\varphi = \pm 60^{\circ}$ 

 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

PRODUCT SUMMARY				
COMPONENT	I <sub>ra</sub> (μΑ)	φ (deg)	λ <sub>0.5</sub> (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

<b>ABSOLUTE MAXIMUM RATINGS</b> (T <sub>amb</sub> = 25 °C, unless otherwise specified)					
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT	
Reverse voltage		V <sub>R</sub>	60	V	
Power dissipation	T <sub>amb</sub> ≤ 25 °C	P <sub>V</sub>	215	mW	
Junction temperature		Tj	100	°C	
Operating temperature range		T <sub>amb</sub>	- 40 to + 100	°C	
Storage temperature range		T <sub>stg</sub>	- 40 to + 100	°C	
Soldering temperature	t ≤ 5 s	T <sub>sd</sub>	260	°C	
Thermal resistance junction/ambient	Connected with Cu wire, 0.14 mm <sup>2</sup>	R <sub>thJA</sub>	350	K/W	



## Vishay Semiconductors

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	I <sub>F</sub> = 50 mA	$V_{F}$		1	1.3	V
Breakdown voltage	I <sub>R</sub> = 100 μA, E = 0	V <sub>(BR)</sub>	60			V
Reverse dark current	V <sub>R</sub> = 10 V, E = 0	I <sub>ro</sub>		2	30	nA
Diode capacitance	$V_R = 0 \text{ V, } f = 1 \text{ MHz, } E = 0$	C <sub>D</sub>		70		pF
Serial resistance	V <sub>R</sub> = 12 V, f = 1 MHz	Rs		400		Ω
Open circuit voltage	$E_{e} = 1 \text{ mW/cm}^{2}, \lambda = 950 \text{ nm}$	Vo		370		mV
Temperature coefficient of Vo	$E_e = 1 \text{ mW/cm}^2, \lambda = 950 \text{ nm}$	TK <sub>Vo</sub>		- 2.6		mV/K
Short circuit current	$E_e = 1 \text{ mW/cm}^2, \lambda = 950 \text{ nm}$	l <sub>k</sub>		75		μΑ
Reverse light current	$E_e = 1 \text{ mW/cm}^2, \lambda = 950 \text{ nm}, V_R = 5 \text{ V}$	I <sub>ra</sub>	55	80		μA
Temperature coefficient of I <sub>ra</sub>	$E_e = 1 \text{ mW/cm}^2, \lambda = 950 \text{ nm}, \ V_R = 10 \text{ V}$	TK <sub>Ira</sub>		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		$\lambda_{p}$		950		nm
Range of spectral bandwidth		λ <sub>0.5</sub>		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 x 10 <sup>-14</sup>		W/√ Hz
Detectivity	$V_R = 10 \text{ V}, \ \lambda = 950 \text{ nm}$	D*		6 x 10 <sup>12</sup>		cm√Hz/W
Rise time	$V_R = 10 \text{ V}, R_L = 1 \text{ k}\Omega, \lambda = 820 \text{ nm}$	t <sub>r</sub>		100		ns
Fall time	$V_R = 10 \text{ V}, R_L = 1 \text{ k}\Omega, \lambda = 820 \text{ nm}$	t <sub>f</sub>		100		ns
Cut-off frequency	$V_R = 12 \text{ V}, R_L = 1 \text{ k}\Omega, \lambda = 870 \text{ nm}$	f <sub>c</sub>		4		MHz
	$V_R = 12 \text{ V}, R_L = 1 \text{ k}\Omega, \lambda = 950 \text{ nm}$	f <sub>c</sub>		1		MHz

### **BASIC CHARACTERISTICS** (T<sub>amb</sub> = 25 °C, unless otherwise specified)

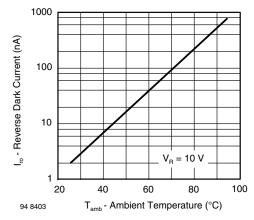


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

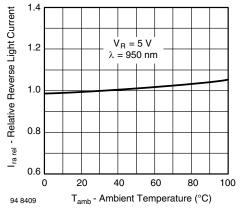


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature



Vishay Semiconductors



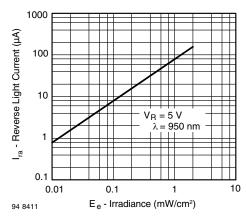


Fig. 3 - Reverse Light Current vs. Irradiance

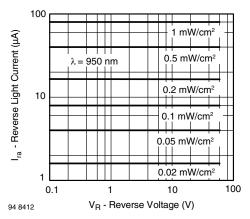


Fig. 4 - Reverse Light Current vs. Reverse Voltage

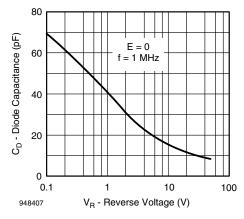


Fig. 5 - Diode Capacitance vs. Reverse Voltage

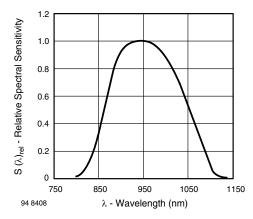


Fig. 6 - Relative Spectral Sensitivity vs. Wavelength

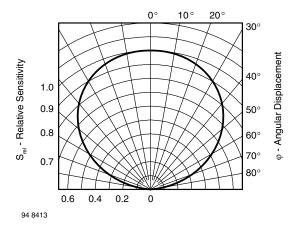
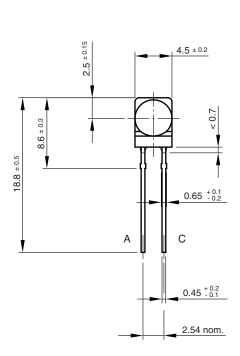


Fig. 7 - Relative Radiant Sensitivity vs. Angular Displacement





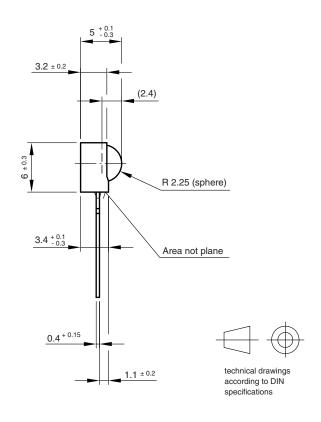
#### **PACKAGE DIMENSIONS** in millimeters



Drawing-No.: 6.544-5199.01-4

Issue: 2; 19.06.01

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