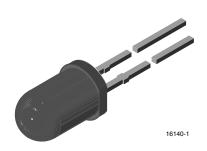


## Silicon PIN Photodiode

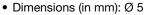


### **DESCRIPTION**

BPV10NF is a PIN photodiode with high speed and high radiant sensitivity in black, T-1¾ plastic package with daylight blocking filter. Filter bandwidth is matched with 870 nm to 950 nm IR emitters.

### **FEATURES**

Package type: leadedPackage form: T-1¾



• Radiant sensitive area (in mm<sup>2</sup>): 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<sub>B</sub> = 12 V

• Fast response times

• Angle of half sensitivity:  $\varphi = \pm 20^{\circ}$ 

 Material categorization: for definitions of compliance please see <a href="https://www.vishay.com/doc?99912"><u>www.vishay.com/doc?99912</u></a>

#### **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 <sub>ra</sub> (μΑ)	I <sub>ra</sub> (μA) φ (deg)		
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-1¾	
BPV10NF-CS21	Reel	MOQ: 5000 pcs, 1000 pcs/reel	T-1¾	

#### 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	$t \le 5 \text{ s, 2 mm from body}$	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	



<b>BASIC CHARACTERISTICS</b> (T <sub>amb</sub> = 25 °C, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	I <sub>F</sub> = 50 mA	$V_{F}$		1.0	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> = 20 V, E = 0	I <sub>ro</sub>		1	5	nA
Diode capacitance	$V_R = 0 V, f = 1 MHz, E = 0$	$C_D$		11		pF
Open circuit voltage	$E_e = 1 \text{ mW/cm}^2, \lambda = 870 \text{ nm}$	Vo		450		mV
Short circuit current	$E_e = 1 \text{ mW/cm}^2, \lambda = 870 \text{ nm}$	I <sub>K</sub>		50		μΑ
Reverse light current	$E_e = 1 \text{ mW/cm}^2$ , $\lambda = 870 \text{ nm}$ , $V_R = 5 \text{ V}$	I <sub>ra</sub>		55		μA
	$E_e = 1 \text{ mW/cm}^2$ , $\lambda = 950 \text{ nm}$ , $V_R = 5 \text{ V}$	I <sub>ra</sub>	30	60		μΑ
Temperature coefficient of I <sub>ra</sub>	$E_e = 1 \text{ mW/cm}^2$ , $\lambda = 870 \text{ nm}$ , $V_R = 5 \text{ V}$	TK <sub>lra</sub>		-0.1		%/K
Absolute spectral sensitivity	$V_R = 5 \text{ V}, \lambda = 870 \text{ nm}$	s(λ)		0.55		A/W
Angle of half sensitivity		φ		± 20		deg
Wavelength of peak sensitivity		$\lambda_{p}$		940		nm
Range of spectral bandwidth		λ <sub>0.5</sub>		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 x 10 <sup>-14</sup>		W/√Hz
Detectivity	V <sub>R</sub> = 20 V, λ = 950 nm	D*		3 x 10 <sup>12</sup>		cm√Hz/W
Rise time	$V_R = 50 \text{ V}, R_L = 50 \Omega, \lambda = 820 \text{ nm}$	t <sub>r</sub>		2.5		ns
Fall time	$V_R = 50 \text{ V}, R_L = 50 \Omega, \lambda = 820 \text{ nm}$	t <sub>f</sub>		2.5		ns

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

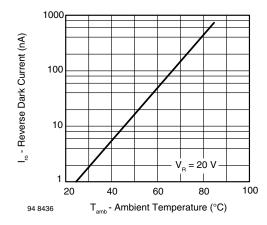


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

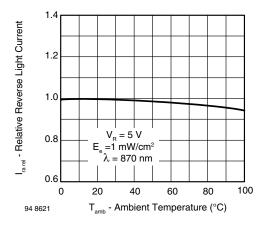


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature



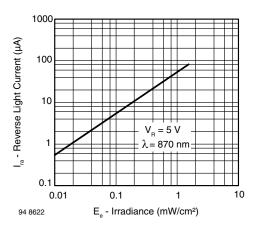


Fig. 3 - Reverse Light Current vs. Irradiance

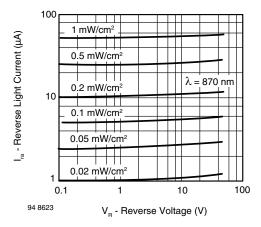


Fig. 4 - Reverse Light Current vs. Reverse Voltage

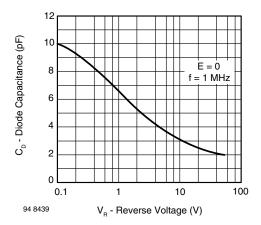


Fig. 5 - Diode Capacitance vs. Reverse Voltage

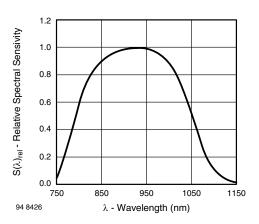


Fig. 6 - Relative Spectral Sensitivity vs. Wavelength

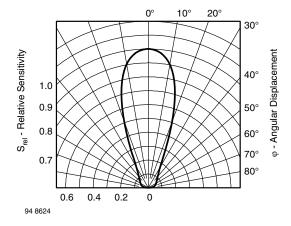
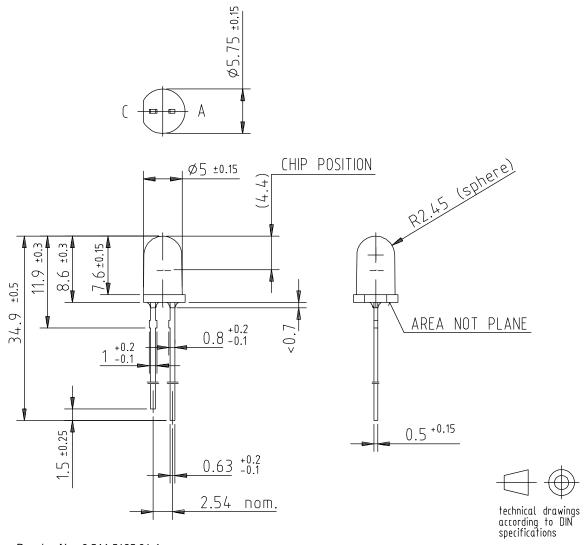


Fig. 7 - Relative Radiant Sensitivity vs. Angular Displacement

### **PACKAGE DIMENSIONS** in millimeters



Drawing-No.: 6.544-5185.01-4

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