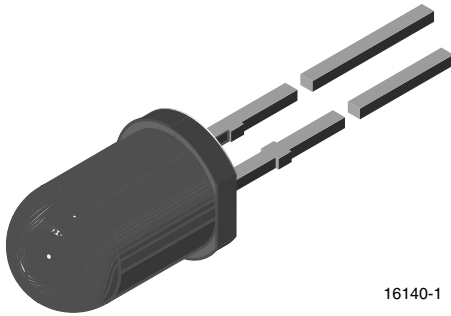


## Silicon PIN Photodiode



16140-1

### DESCRIPTION

BPV10NF is a PIN photodiode with high speed and high sensitivity in black, T-1 $\frac{3}{4}$  plastic package with daylight blocking filter. Filter bandwidth is matched with 850 nm to 950 nm IR emitters.

### FEATURES

- Package type: leaded
- Package form: T-1 $\frac{3}{4}$
- Dimensions (in mm):  $\varnothing$  5
- Leads with stand-off
- High sensitivity
- Daylight blocking filter matched with 850 nm to 950 nm emitters
- Fast response times
- Angle of half sensitivity:  $\theta = \pm 20^\circ$
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



### 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	$I_{ra}$ ( $\mu$ A) at $E_e = 1.0 \text{ mW/cm}^2$ , $\lambda = 940 \text{ nm}$ , $V_R = 5.0 \text{ V}$	$\phi$ ( $^\circ$ )	$\lambda_{0.5}$ (nm)
BPV10NF	60	$\pm 20$	780 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-1 $\frac{3}{4}$
BPV10NF-CS21	Reel	MOQ: 5000 pcs, 1000 pcs/reel	T-1

#### Note

- MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS ( $T_{amb} = 25^\circ\text{C}$ , unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		$V_R$	60	V
Power dissipation	$T_{amb} \leq 25^\circ\text{C}$	$P_V$	215	mW
Junction temperature		$T_j$	100	$^\circ\text{C}$
Operating temperature range		$T_{amb}$	-40 to +100	$^\circ\text{C}$
Storage temperature range		$T_{stg}$	-40 to +100	$^\circ\text{C}$
Soldering temperature	$t \leq 5 \text{ s}$ , 2 mm from body	$T_{sd}$	260	$^\circ\text{C}$
Thermal resistance junction to ambient	Connected with Cu wire, 0.14 mm $^2$	$R_{thJA}$	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
Forward voltage	$I_F = 50\text{ mA}$	$V_F$	-	0.85	1.3	V
Breakdown voltage	$I_R = 100\text{ }\mu\text{A}$ , $E = 0$	$V_{(BR)}$	60	-	-	V
Reverse dark current	$V_R = 20\text{ V}$ , $E = 0$	$I_{ro}$	-	0.1	5	nA
Diode capacitance	$V_R = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$	$C_D$	-	11	-	pF
Open circuit voltage	$E_e = 1\text{ mW/cm}^2$ , $\lambda = 850\text{ nm}$	$V_O$	-	410	-	mV
Short circuit current	$E_e = 1\text{ mW/cm}^2$ , $\lambda = 870\text{ nm}$	$I_K$	-	50	-	$\mu\text{A}$
Reverse light current	$E_e = 1\text{ mW/cm}^2$ , $\lambda = 870\text{ nm}$ , $V_R = 5\text{ V}$	$I_{ra}$	-	55	-	$\mu\text{A}$
	$E_e = 1\text{ mW/cm}^2$ , $\lambda = 940\text{ nm}$ , $V_R = 5\text{ V}$	$I_{ra}$	30	60	-	$\mu\text{A}$
Temperature coefficient of $I_{ra}$	$E_e = 1\text{ mW/cm}^2$ , $\lambda = 870\text{ nm}$ , $V_R = 5\text{ V}$	$TK_{Ira}$	-	-0.1	-	%/K
Absolute spectral sensitivity	$V_R = 5\text{ V}$ , $\lambda = 870\text{ nm}$	$s(\lambda)$	-	0.55	-	A/W
Angle of half sensitivity		$\phi$	-	$\pm 20$	-	$^{\circ}$
Wavelength of peak sensitivity		$\lambda_p$	-	940	-	nm
Range of spectral bandwidth		$\lambda_{0.5}$	-	780 to 1050	-	nm
Quantum efficiency	$\lambda = 950\text{ nm}$	$\eta$	-	70	-	%
Noise equivalent power	$V_R = 20\text{ V}$ , $\lambda = 950\text{ nm}$	NEP	-	$3 \times 10^{-14}$	-	$\text{W}/\sqrt{\text{Hz}}$
Detectivity	$V_R = 20\text{ V}$ , $\lambda = 950\text{ nm}$	D	-	$3 \times 10^{12}$	-	$\text{cm}\sqrt{\text{Hz}}/\text{W}$
Rise time	$V_R = 10\text{ V}$ , $R_L = 50\text{ }\Omega$ , $\lambda = 830\text{ nm}$	$t_r$	-	80	-	ns
Fall time	$V_R = 10\text{ V}$ , $R_L = 50\text{ }\Omega$ , $\lambda = 830\text{ nm}$	$t_f$	-	60	-	ns

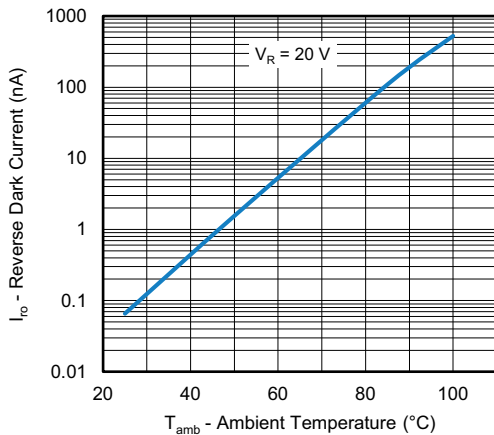
**BASIC CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

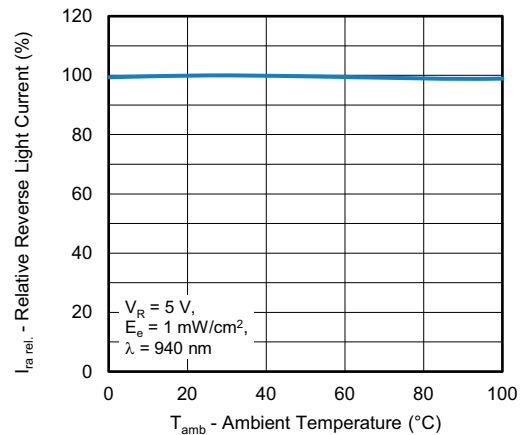


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

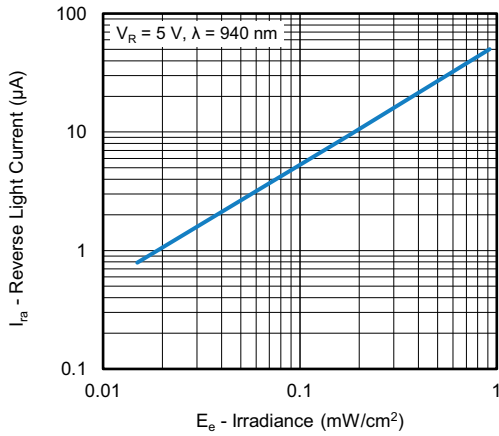


Fig. 3 - Reverse Light Current vs. Irradiance

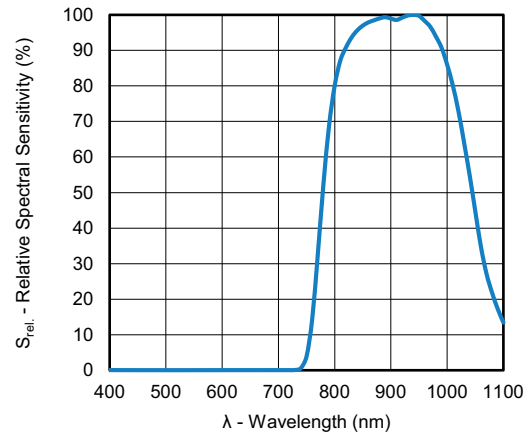


Fig. 6 - Relative Spectral Sensitivity vs. Wavelength

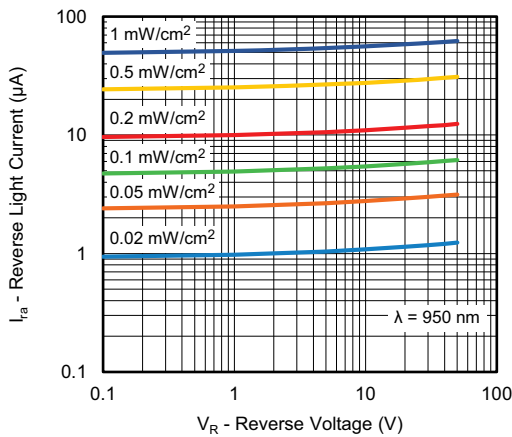


Fig. 4 - Reverse Light Current vs. Reverse Voltage

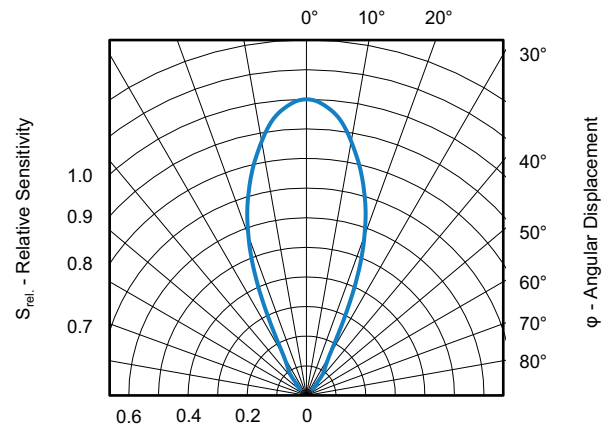


Fig. 7 - Relative Sensitivity vs. Angular Displacement

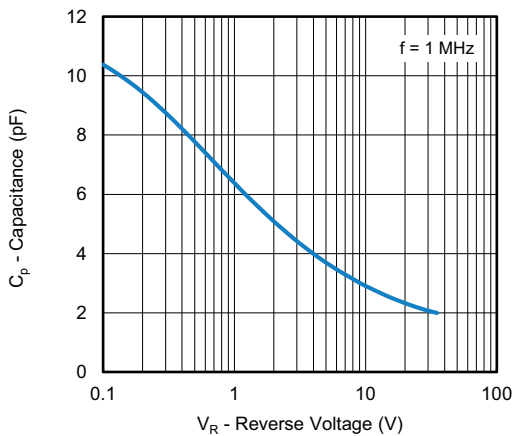
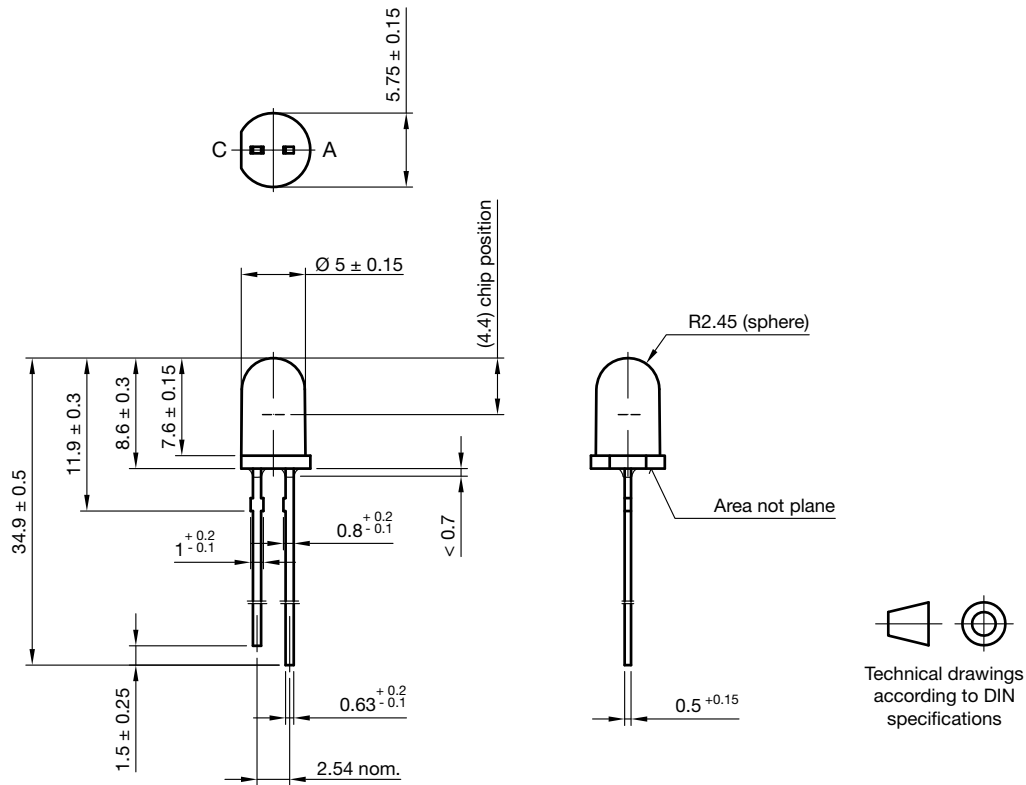


Fig. 5 - Diode Capacitance vs. Reverse Voltage



PACKAGE DIMENSIONS in millimeters



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