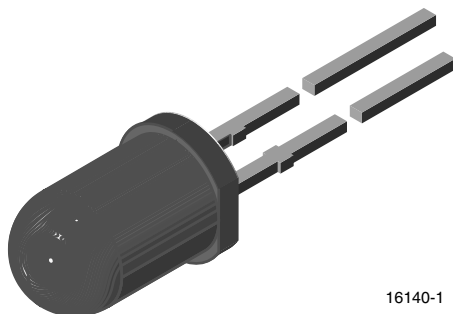


Silicon PIN Photodiode



16140-1

DESCRIPTION

BPV10NF is a PIN photodiode with high speed and high sensitivity in black, T-1¾ 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-1¾
- Dimensions (in mm): Ø 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



RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

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} (µA) at $E_e = 1.0 \text{ mW/cm}^2$, $\lambda = 940 \text{ nm}$, $V_R = 5.0 \text{ V}$	ϕ (°)	$\lambda_{0.5}$ (nm)
BPV10NF	60	± 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-1¾
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

BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, 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	-	μA
Reverse light current	$E_e = 1\text{ mW/cm}^2$, $\lambda = 870\text{ nm}$, $V_R = 5\text{ V}$	I_{ra}	-	55	-	μA
	$E_e = 1\text{ mW/cm}^2$, $\lambda = 940\text{ nm}$, $V_R = 5\text{ V}$	I_{ra}	30	60	-	μA
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		ϕ	-	± 20	-	$^{\circ}$
Wavelength of peak sensitivity		λ_p	-	940	-	nm
Range of spectral bandwidth		$\lambda_{0.5}$	-	780 to 1050	-	nm
Quantum efficiency	$\lambda = 950\text{ nm}$	η	-	70	-	%
Noise equivalent power	$V_R = 20\text{ V}$, $\lambda = 950\text{ nm}$	NEP	-	3×10^{-14}	-	$\text{W}/\sqrt{\text{Hz}}$
Detectivity	$V_R = 20\text{ V}$, $\lambda = 950\text{ nm}$	D	-	3×10^{12}	-	$\text{cm}^2/\text{Hz}/\text{W}$
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

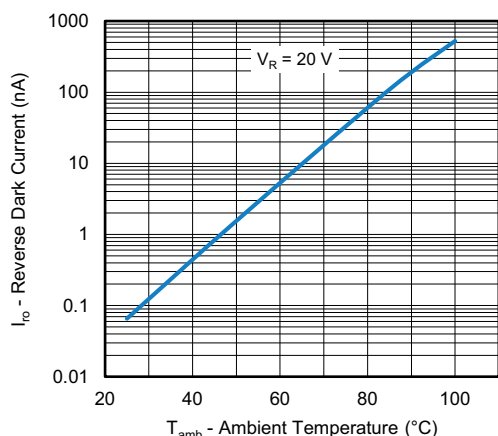
BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

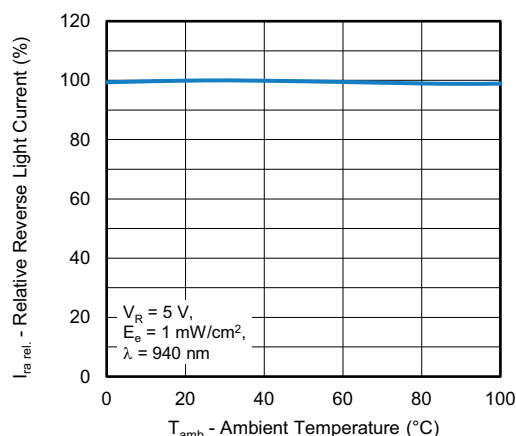


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

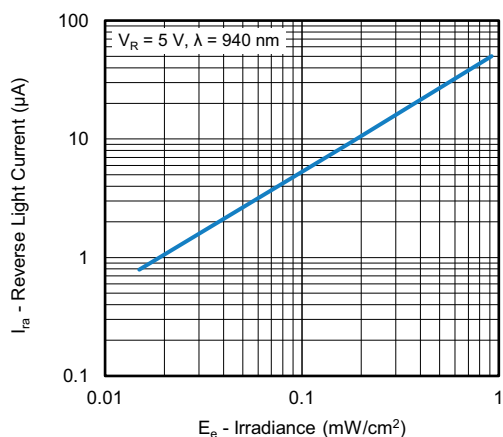


Fig. 3 - Reverse Light Current vs. Irradiance

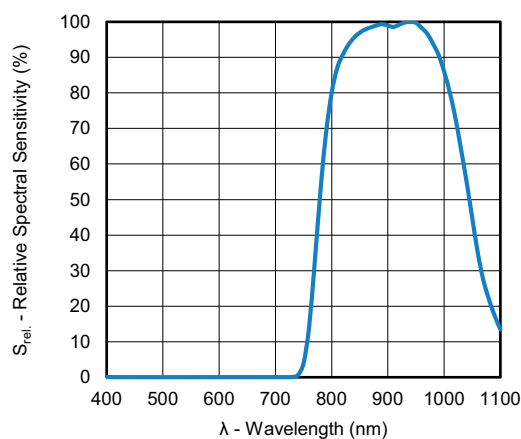


Fig. 6 - Relative Spectral Sensitivity vs. Wavelength

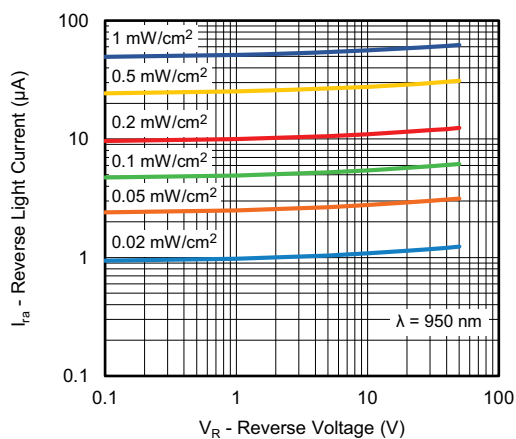


Fig. 4 - Reverse Light Current vs. Reverse Voltage

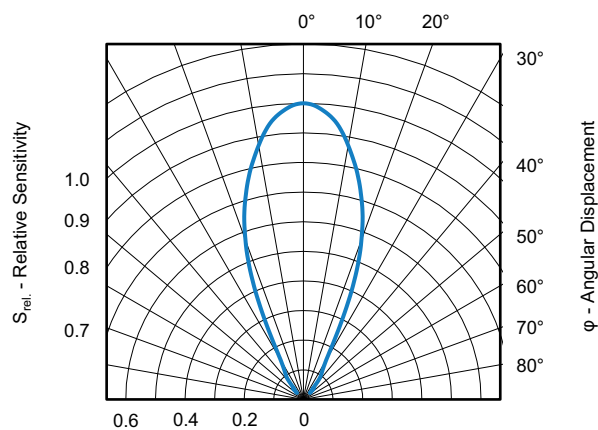


Fig. 7 - Relative Sensitivity vs. Angular Displacement

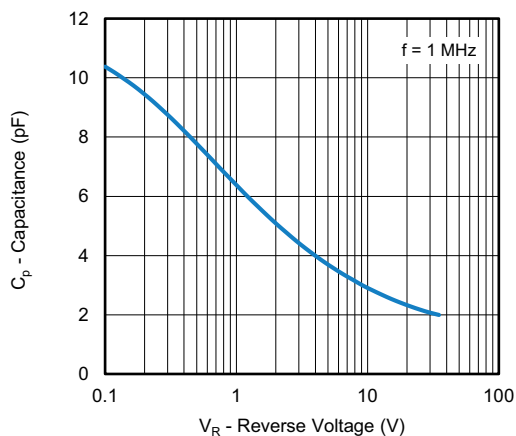
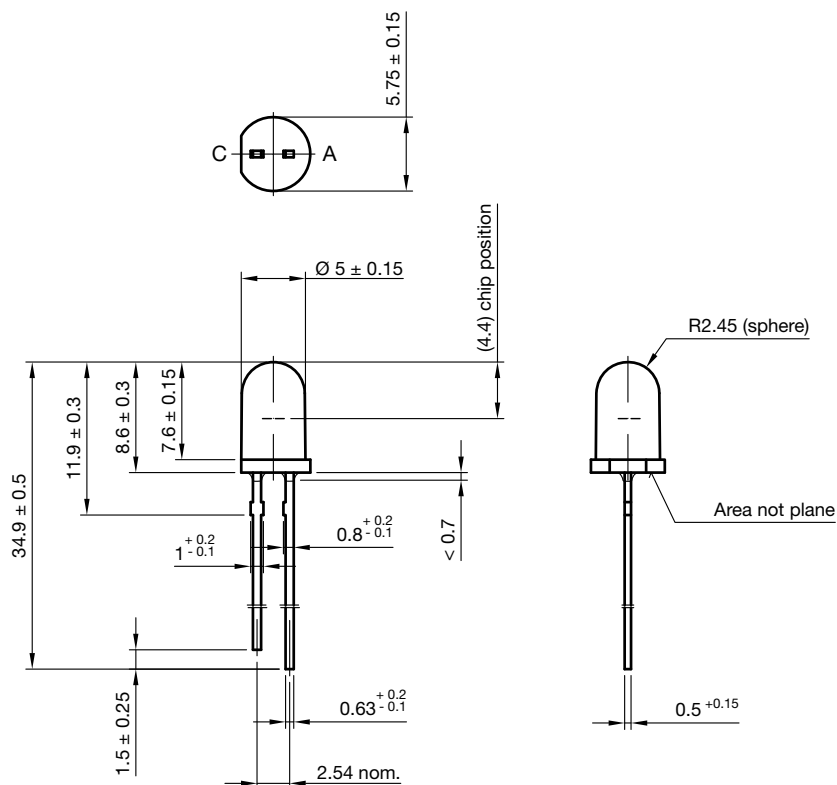


Fig. 5 - Diode Capacitance vs. Reverse Voltage

PACKAGE DIMENSIONS in millimeters


Technical drawings
according to DIN
specifications

Drawing-No.: 6.544-5185.01-4

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