

Vishay Semiconductors

Silicon NPN Phototransistor



DESCRIPTION

BPV11 is a silicon NPN phototransistor with high radiant sensitivity in clear, T-1¾ plastic package with base terminal. It is sensitive to visible and near infrared radiation.

FEATURES

Package type: leadedPackage form: T-1¾

• Dimensions (in mm): Ø 5

- High photo sensitivity
- · High radiant sensitivity
- Suitable for visible and near infrared radiation
- Fast response times
- Angle of half sensitivity: $\varphi = \pm 15^{\circ}$
- · Base terminal connected
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912



GREEN (5-2008)

APPLICATIONS

• Detector for industrial electronic circuitry, measurement and control

PRODUCT SUMMARY				
COMPONENT	I _{ca} (mA)	φ (deg)	λ _{0.1} (nm)	
BPV11	10	± 15	450 to 1080	

Note

· Test condition see table "Basic Characteristics"

ORDERING INFORMATION				
ORDERING CODE	PACKAGING REMARK		PACKAGE FORM	
BPV11	Bulk	MOQ: 4000 pcs, 4000 pcs/bulk	T-1¾	

Note

· MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS (T _{amb} = 25 °C, unless otherwise specified)					
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT	
Collector base voltage		V _{CBO}	80	V	
Collector emitter voltage		V _{CEO}	70	V	
Emitter base voltage		V _{EBO}	5	V	
Collector current		Ic	50	mA	
Collector peak current	$t_p/T = 0.5, t_p \le 10 \text{ ms}$	I _{CM}	100	mA	
Power dissipation	T _{amb} ≤ 47 °C	P _V	150	mW	
Junction temperature		Tj	100	°C	
Operating temperature range		T _{amb}	- 40 to + 100	°C	
Storage temperature range		T _{stg}	- 40 to + 100	°C	
Soldering temperature	$t \le 5$ s, 2 mm from body	T _{sd}	260	°C	
Thermal resistance junction/ambient	Connected with Cu wire, 0.14 mm ²	R _{thJA}	350	K/W	



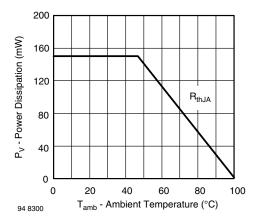


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

BASIC CHARACTERISTICS (T _{amb} = 25 °C, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Collector emitter breakdown voltage	I _C = 1 mA	V _{(BR)CEO}	70			V
Collector emitter dark current	$V_{CE} = 10 \text{ V}, E = 0$	I _{CEO}		1	50	nA
DC current gain	$V_{CE} = 5 \text{ V}, I_{C} = 5 \text{ mA}, E = 0$	h _{FE}		450		
Collector emitter capacitance	$V_{CE} = 0 \text{ V, } f = 1 \text{ MHz, } E = 0$	C _{CEO}		15		pF
Collector base capacitance	$V_{BE} = 0 \text{ V, } f = 1 \text{ MHz, } E = 0$	C _{CBO}		19		pF
Collector light current	$E_e = 1$ mW/cm ² , $\lambda = 950$ nm, $V_{CE} = 5$ V	I _{ca}	3	10		mA
Angle of half sensitivity		φ		± 15		deg
Wavelength of peak sensitivity		λ_{p}		850		nm
Range of spectral bandwidth		λ _{0.1}		450 to 1080		nm
Collector emitter saturation voltage	$E_e = 1 \text{ mW/cm}^2$, $\lambda = 950 \text{ nm}$, $I_C = 1 \text{ mA}$	V_{CEsat}		130	300	mV
Turn-on time	$V_S = 5 \text{ V}, I_C = 5 \text{ mA}, R_L = 100 \Omega$	t _{on}		6		μs
Turn-off time	$V_S = 5 \text{ V}, I_C = 5 \text{ mA}, R_L = 100 \Omega$	t _{off}		5		μs
Cut-off frequency	$V_S = 5 \text{ V}, I_C = 5 \text{ mA}, R_L = 100 \Omega$	f _c		110	•	kHz

BASIC CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

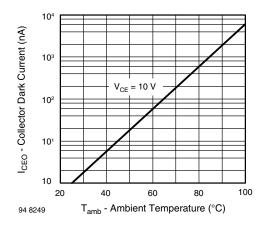


Fig. 2 - Collector Dark Current vs. Ambient Temperature

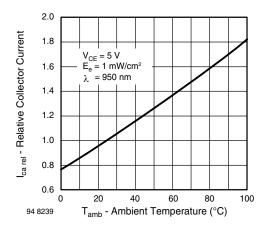


Fig. 3 - Relative Collector Current vs. Ambient Temperature



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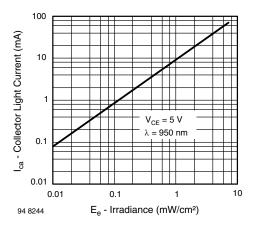


Fig. 4 - Collector Light Current vs. Irradiance

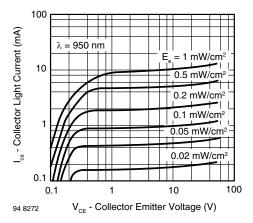


Fig. 5 - Collector Light Current vs. Collector Emitter Voltage

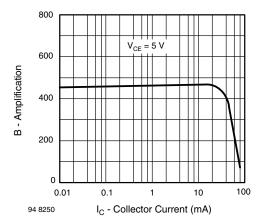


Fig. 6 - Amplification vs. Collector Current

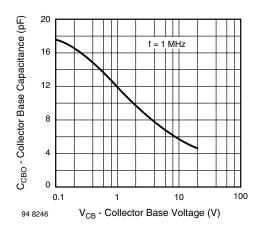


Fig. 7 - Collector Base Capacitance vs. Collector Base Voltage

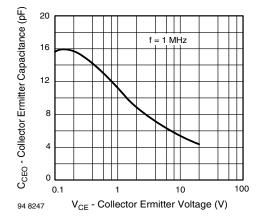


Fig. 8 - Collector Emitter Capacitance vs. Collector Emitter Voltage

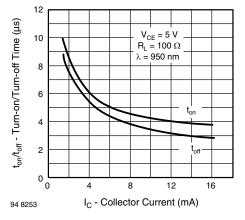
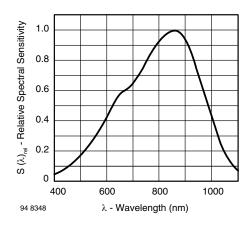
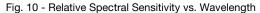


Fig. 9 - Turn-on/Turn-off Time vs. Collector Current



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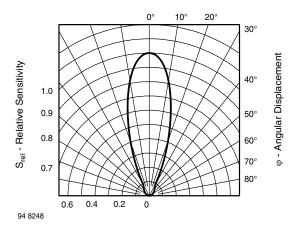
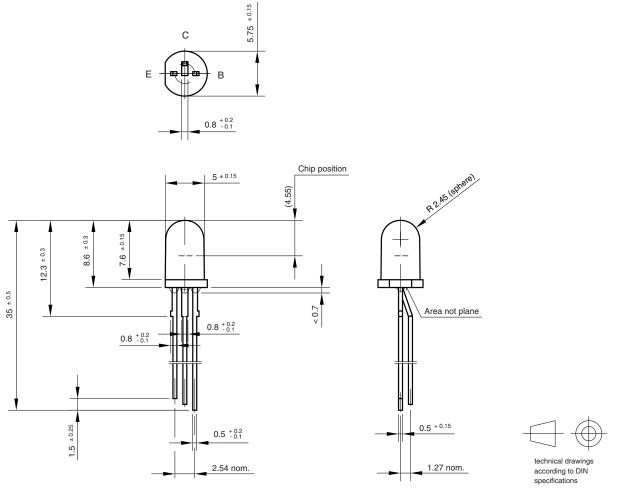


Fig. 11 - Relative Radiant Sensitivity vs. Angular Displacement

PACKAGE DIMENSIONS in millimeters



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