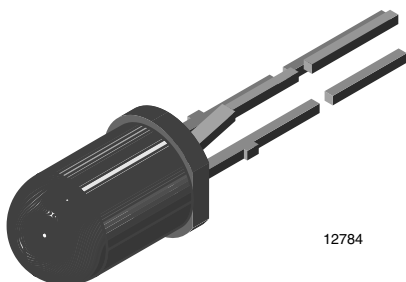


# Silicon NPN Phototransistor



## FEATURES

- Package type: leaded
- Package form: T-1¾
- Dimensions (in mm): Ø 5
- High radiant sensitivity
- Daylight blocking filter matched with 940 nm emitters
- Fast response times
- Angle of half sensitivity:  $\phi = \pm 15^\circ$
- Base terminal connected
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT

## DESCRIPTION

BPV11F is a silicon NPN phototransistor with high radiant sensitivity in black, T-1¾ plastic package with base terminal and daylight blocking filter. Filter bandwidth is matched with 900 nm to 950 nm IR emitters.

## APPLICATIONS

- Detector for industrial electronic circuitry, measurement and control

## PRODUCT SUMMARY

COMPONENT	$I_{ca}$ (mA)	$\phi$ (deg)	$\lambda_{0.5}$ (nm)
BPV11F	9	$\pm 15$	900 to 980

### Note

- Test condition see table "Basic Characteristics"

## ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
BPV11F	Bulk	MOQ: 4000 pcs, 4000 pcs/bulk	T-1¾

### Note

- MOQ: minimum order quantity

## ABSOLUTE MAXIMUM RATINGS ( $T_{amb} = 25^\circ\text{C}$ , 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		$I_C$	50	mA
Collector peak current	$t_p/T = 0.5, t_p \leq 10 \text{ ms}$	$I_{CM}$	100	mA
Power dissipation	$T_{amb} \leq 47^\circ\text{C}$	$P_V$	150	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	$t \leq 5 \text{ s}, 2 \text{ mm from body}$	$T_{sd}$	260	$^\circ\text{C}$
Thermal resistance junction/ambient	Connected with Cu wire, $0.14 \text{ mm}^2$	$R_{thJA}$	350	K/W

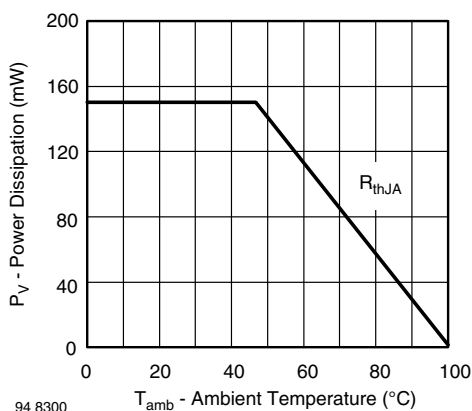


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

BASIC CHARACTERISTICS ( $T_{amb} = 25^{\circ}\text{C}$ , unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Collector emitter breakdown voltage	$I_C = 1\text{ mA}$	$V_{(BR)CEO}$	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	$V_{CE} = 0\text{ V}, f = 1\text{ MHz}, E = 0$	$C_{CBO}$		19		pF
Collector light current	$E_e = 1\text{ mW/cm}^2, \lambda = 950\text{ nm}, V_{CB} = 5\text{ V}$	$I_{ca}$	3	9		mA
Angle of half sensitivity		$\phi$		$\pm 15$		deg
Wavelength of peak sensitivity		$\lambda_p$		930		nm
Range of spectral bandwidth		$\lambda_{0.5}$		900 to 980		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		$\mu\text{s}$
Turn-off time	$V_S = 5\text{ V}, I_C = 5\text{ mA}, R_L = 100\ \Omega$	$t_{off}$		5		$\mu\text{s}$
Cut-off frequency	$V_S = 5\text{ V}, I_C = 5\text{ mA}, R_L = 100\ \Omega$	$f_c$		110		kHz

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

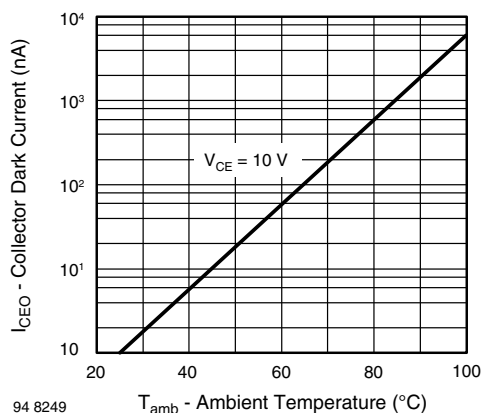


Fig. 2 - Collector Dark Current vs. Ambient Temperature

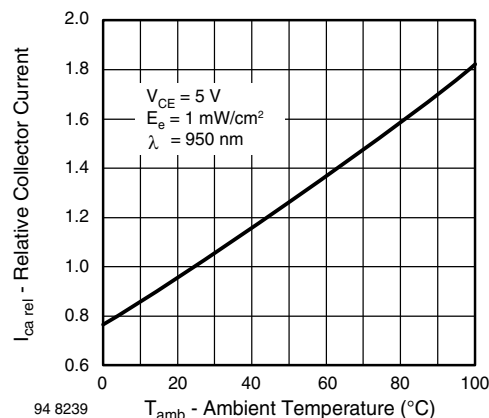


Fig. 3 - Relative Collector Current vs. Ambient Temperature

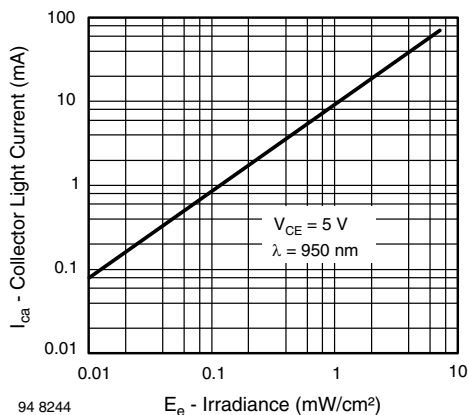


Fig. 4 - Collector Light Current vs. Irradiance

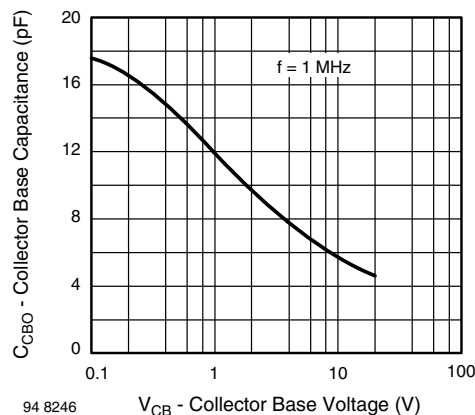


Fig. 7 - Collector Base Capacitance vs. Collector Base Voltage

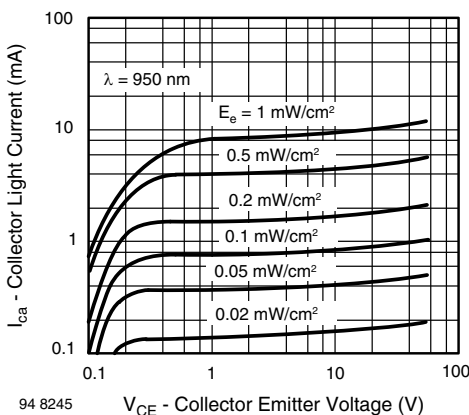


Fig. 5 - Collector Light Current vs. Collector Emitter Voltage

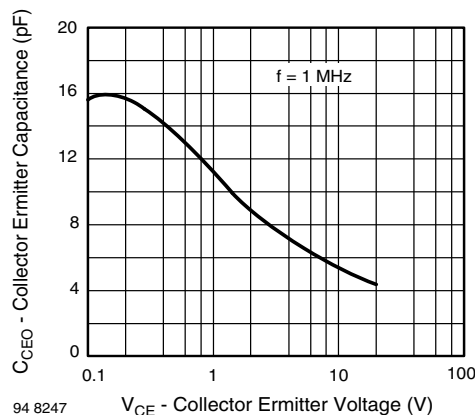


Fig. 8 - Collector Emitter Capacitance vs. Collector Emitter Voltage

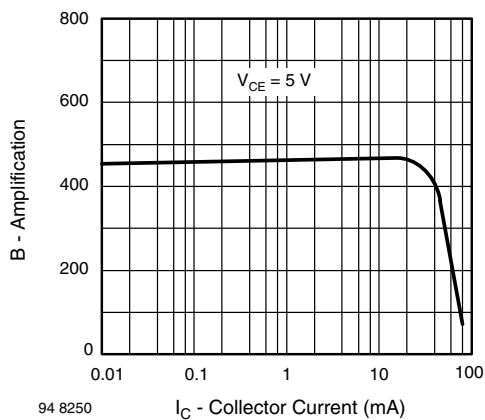


Fig. 6 - Amplification vs. Collector Current

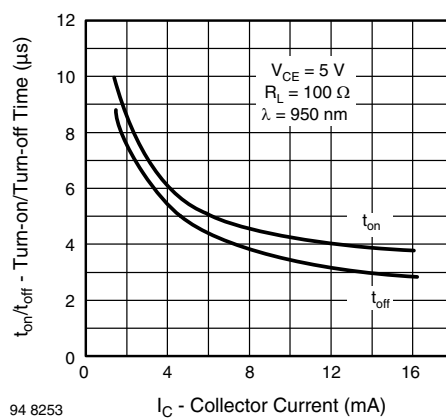


Fig. 9 - Turn-on/Turn-off Time vs. Collector Current

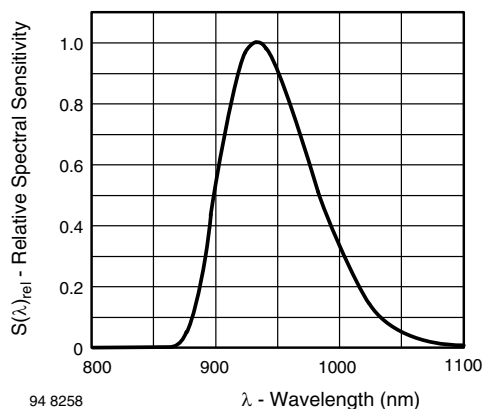


Fig. 10 - Relative Spectral Sensitivity vs. Wavelength

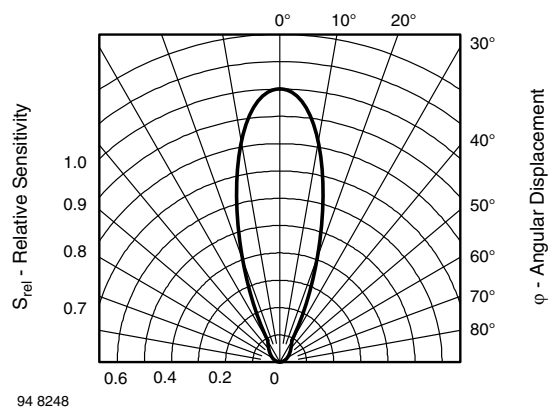
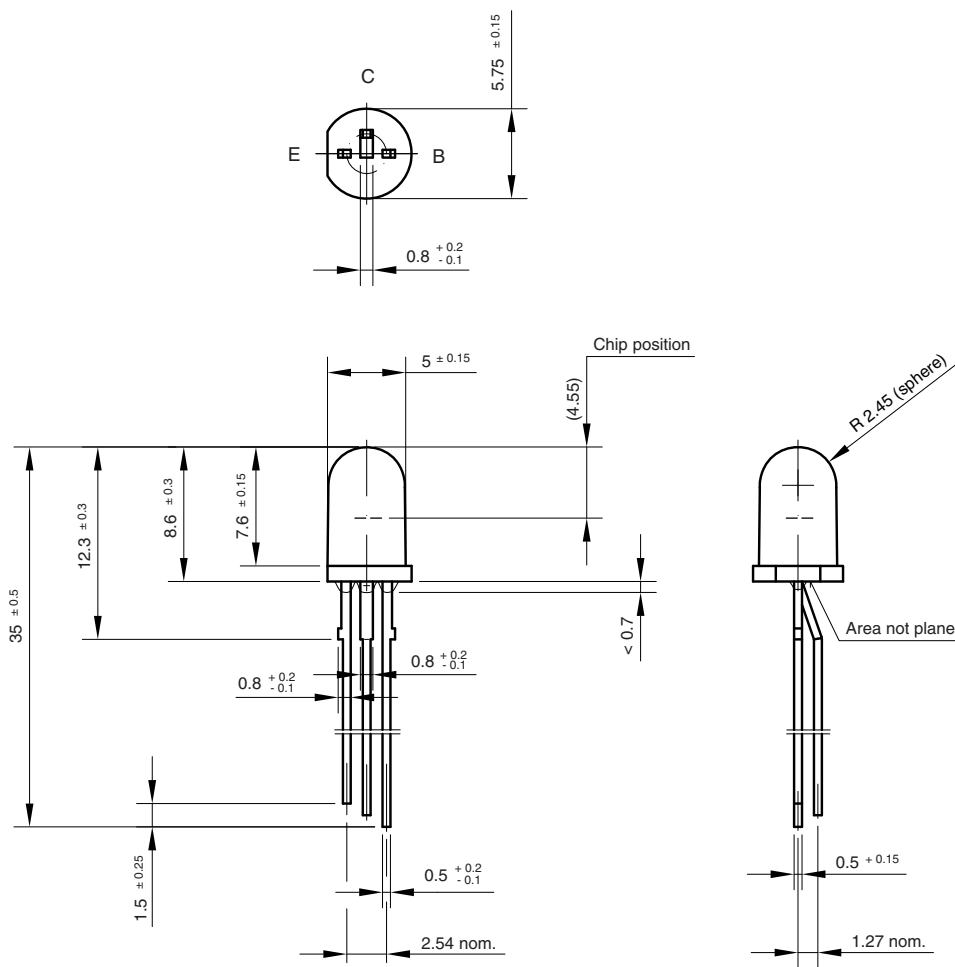


Fig. 11 - Relative Radiant Sensitivity vs. Angular Displacement

### PACKAGE DIMENSIONS in millimeters



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