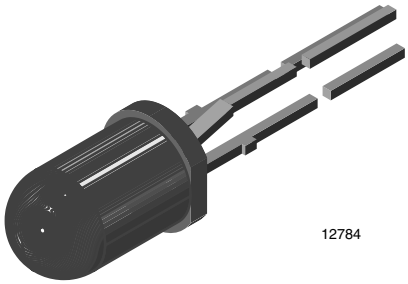
Silicon NPN Phototransistor



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: φ = ± 15°
- Base terminal connected
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

Pb-free

e4

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)	φ (deg)	$\lambda_{0.5}$ (nm)
BPV11F	9	± 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 °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 ms	I_{CM}	100	mA
Power dissipation	$T_{amb} \leq$ 47 °C	P_V	150	mW
Junction temperature		T_j	100	°C
Operating temperature range		T_{amb}	- 40 to + 100	°C
Storage temperature range		T_{stg}	- 40 to + 100	°C
Soldering temperature	t ≤ 5 s, 2 mm from body	T_{sd}	260	°C
Thermal resistance junction/ambient	Connected with Cu wire, 0.14 mm²	R_{thJA}	350	K/W

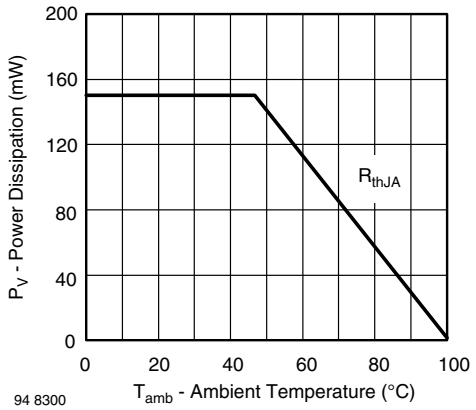


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

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 V, E = 0	I_{CEO}		1	50	nA
DC current gain	V_{CE} = 5 V, I_C = 5 mA, E = 0	h_{FE}		450		
Collector emitter capacitance	V_{CE} = 0 V, f = 1 MHz, E = 0	C_{CEO}		15		pF
Collector base capacitance	V_{CE} = 0 V, f = 1 MHz, E = 0	C_{CBO}		19		pF
Collector light current	E_e = 1 mW/cm², λ = 950 nm, V_{CB} = 5 V	I_{ca}	3	9		mA
Angle of half sensitivity		φ		± 15		deg
Wavelength of peak sensitivity		λ_p		930		nm
Range of spectral bandwidth		$\lambda_{0.5}$		900 to 980		nm
Collector emitter saturation voltage	E_e = 1 mW/cm², λ = 950 nm, I_C = 1 mA	V_{CEsat}		130	300	mV
Turn-on time	V_S = 5 V, I_C = 5 mA, R_L = 100 Ω	t_{on}		6		µs
Turn-off time	V_S = 5 V, I_C = 5 mA, R_L = 100 Ω	t_{off}		5		µs
Cut-off frequency	V_S = 5 V, I_C = 5 mA, R_L = 100 Ω	f_c		110		kHz

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

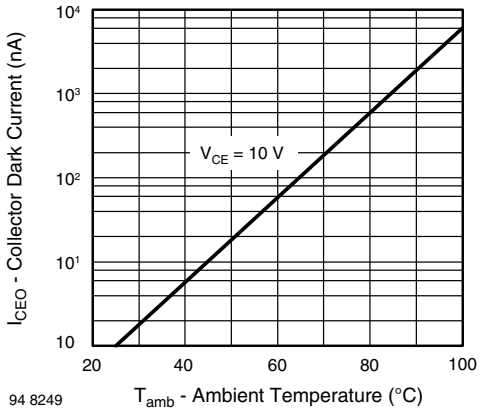


Fig. 2 - Collector Dark Current vs. Ambient Temperature

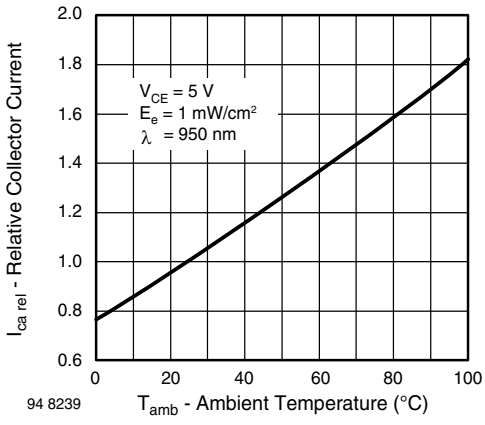


Fig. 3 - Relative Collector Current vs. Ambient Temperature

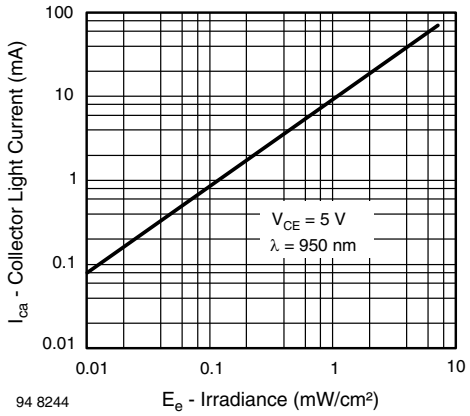


Fig. 4 - Collector Light Current vs. Irradiance

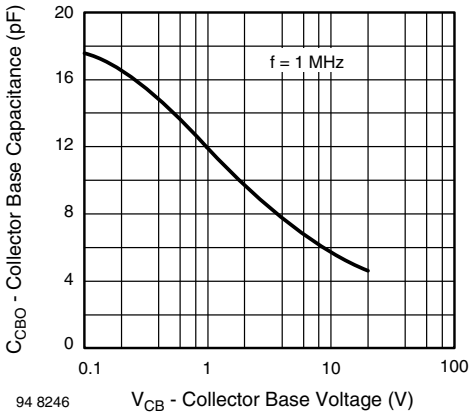


Fig. 7 - Collector Base Capacitance vs. Collector Base Voltage

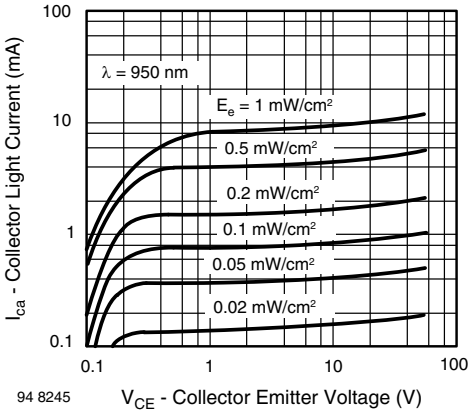


Fig. 5 - Collector Light Current vs. Collector Emitter Voltage

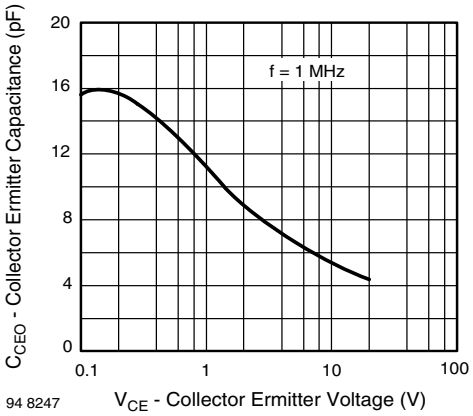


Fig. 8 - Collector Emitter Capacitance vs. Collector Emitter Voltage

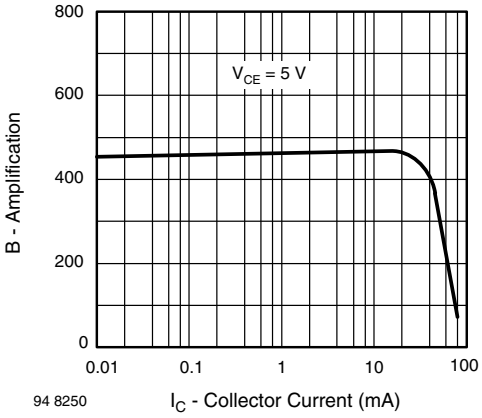


Fig. 6 - Amplification vs. Collector Current

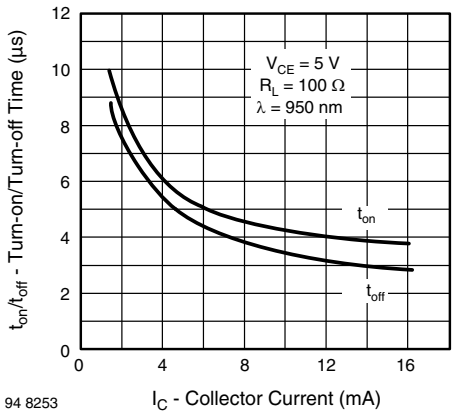


Fig. 9 - Turn-on/Turn-off Time vs. Collector Current

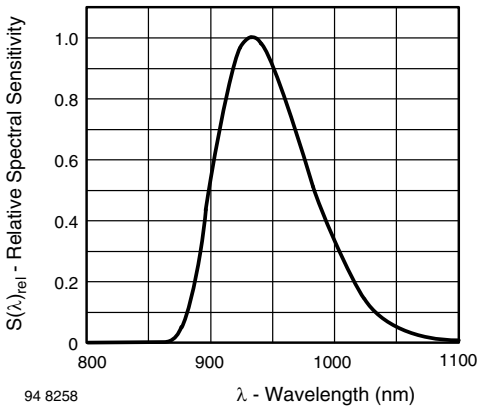


Fig. 10 - Relative Spectral Sensitivity vs. Wavelength

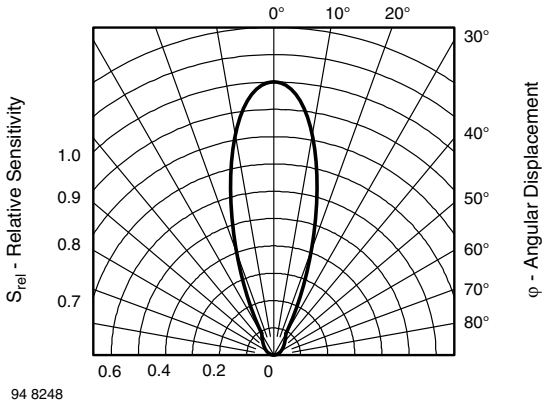
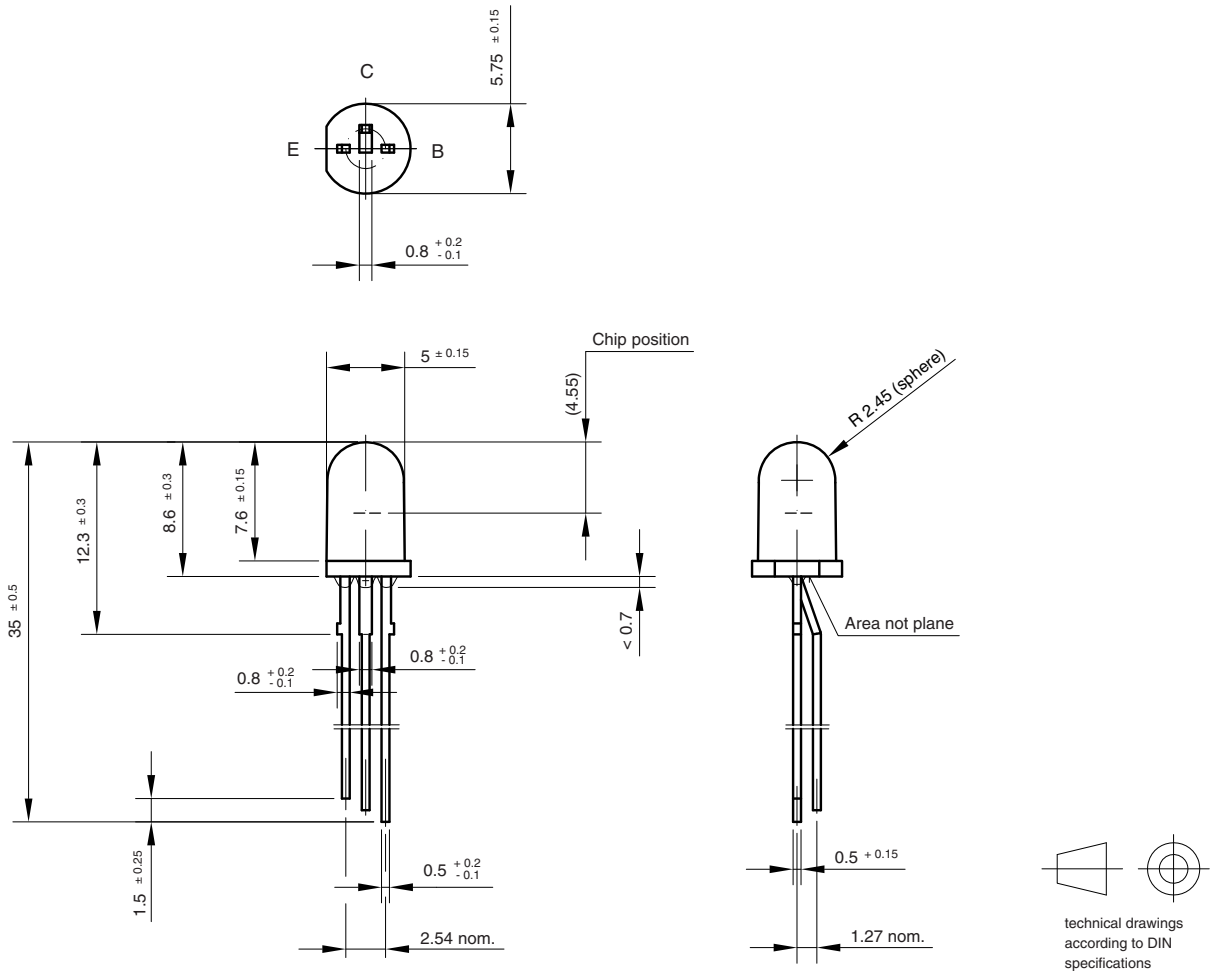


Fig. 11 - Relative Radiant Sensitivity vs. Angular Displacement

PACKAGE DIMENSIONS in millimeters



Drawing-No.: 6.544-5188.01-4
Issue:1; 01.07.96
96 12200

Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, “Vishay”), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay’s knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer’s responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer’s technical experts. Product specifications do not expand or otherwise modify Vishay’s terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.