

Silicon NPN Phototransistor



FEATURES

 Package type: leaded • Package form: T-1

• Dimensions (in mm): Ø 3

· High photo sensitivity · High radiant sensitivity

• Suitable for visible and near infrared radiation

· Fast response times

• Angle of half sensitivity: $\varphi = \pm 25^{\circ}$

• Material categorization: for definitions of compliance please see www.vishay.com/doc?99912





HALOGEN FREE

GREEN

APPLICATIONS

Detector in electronic control and drive circuits

DESCRIPTION

BPW85 is a silicon NPN phototransistor with high radiant sensitivity in clear, T-1 plastic package. It is sensitive to visible and near infrared radiation.

PRODUCT SUMMARY						
COMPONENT	I _{ca} (mA)	φ (deg)	λ _{0.1} (nm)			
BPW85	0.8 to 8	± 25	450 to 1080			
BPW85A	0.8 to 2.5	± 25	450 to 1080			
BPW85B	1.5 to 4	± 25	450 to 1080			
BPW85C	3 to 8	± 25	450 to 1080			

Note

· Test condition see table "Basic Characteristics"

ORDERING INFORMATION						
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM			
BPW85	Bulk	MOQ: 5000 pcs, 5000 pcs/bulk	T-1			
BPW85A	Bulk	MOQ: 5000 pcs, 5000 pcs/bulk	T-1			
BPW85B	Bulk	MOQ: 5000 pcs, 5000 pcs/bulk	T-1			
BPW85C	Bulk	MOQ: 5000 pcs, 5000 pcs/bulk	T-1			

Note

· MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS (T _{amb} = 25 °C, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT		
Collector emitter voltage		V _{CEO}	70	V		
Emitter collector voltage		V _{ECO}	5	V		
Collector current		I _C	50	mA		
Collector peak current	$t_p/T = 0.5, t_p \le 10 \text{ ms}$	I _{CM}	100	mA		
Power dissipation	T _{amb} ≤ 55 °C	P _V	100	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 ≤ 3 s, 2 mm from case	T _{sd}	260	°C		
Thermal resistance junction/ambient	Connected with Cu wire Ø 0.14 mm ²	R _{thJA}	450	K/W		

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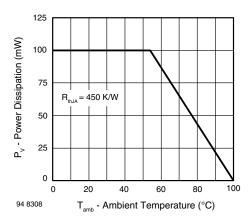


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

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} = 20 V, E = 0	I _{CEO}		1	200	nA	
Collector emitter capacitance	$V_{CE} = 5 \text{ V, f} = 1 \text{ MHz, E} = 0$	C _{CEO}		3		pF	
Angle of half sensitivity		φ		± 25		deg	
Wavelength of peak sensitivity		λ_{p}		850		nm	
Range of spectral bandwidth		λ _{0.1}		450 to 1080		nm	
Collector emitter saturation voltage	$E_e = 1 \text{ mW/cm}^2, \lambda = 950 \text{ nm},$ $I_C = 0.1 \text{ mA}$	V _{CEsat}			0.3	V	
Turn-on time	$V_{S} = 5 \text{ V}, I_{C} = 5 \text{ mA}, R_{L} = 100 \Omega$	t _{on}		2.0		μs	
Turn-off time	$V_S = 5 \text{ V}, I_C = 5 \text{ mA}, R_L = 100 \Omega$	t _{off}		2.3		μs	
Cut-off frequency	$V_S = 5 \text{ V}, I_C = 5 \text{ mA}, R_L = 100 \Omega$	f _c		180		kHz	

TYPE DEDICATED CHARACTERISTICS							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Collector light current		BPW85	I _{ca}	0.8		8.0 m. 2.5 m.	mA
	$E_{\rm e}$ = 1 mW/cm ² , λ = 950 nm, $V_{\rm CE}$ = 5 V	BPW85A	I _{ca}	0.8		2.5	mA
		BPW85B	I _{ca}	1.5		4.0	mA
		BPW85C	I _{ca}	3.0		8.0	mA

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

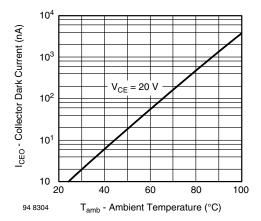


Fig. 2 - Collector Dark Current vs. Ambient Temperature

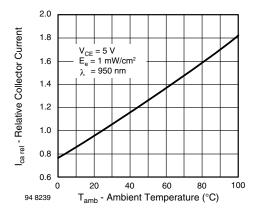


Fig. 3 - Relative Collector Current vs. Ambient Temperature

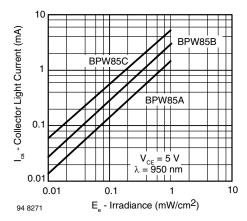


Fig. 4 - Collector Light Current vs. Irradiance

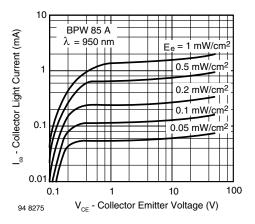


Fig. 5 - Collector Light Current vs. Collector Emitter Voltage

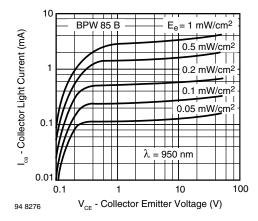


Fig. 6 - Collector Light Current vs. Collector Emitter Voltage

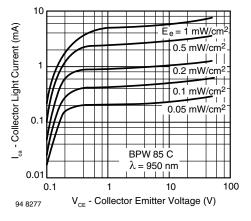


Fig. 7 - Collector Light Current vs. Collector Emitter Voltage

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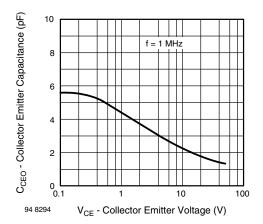


Fig. 8 - Collector Emitter Capacitance vs. Collector Emitter Voltage

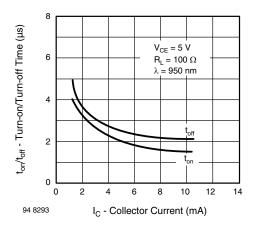


Fig. 9 - Turn-on/Turn-off Time vs. Collector Current

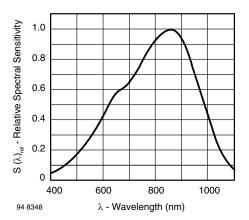


Fig. 10 - Relative Spectral Sensitivity vs. Wavelength

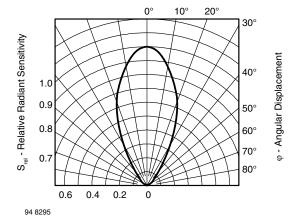
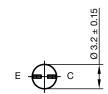
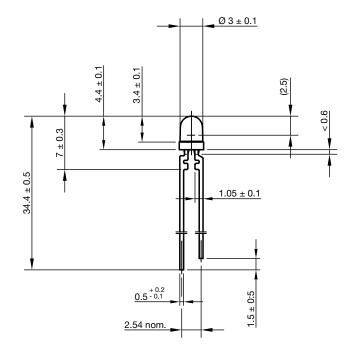
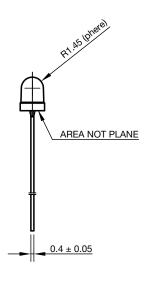


Fig. 11 - Relative Radiant Sensitivity vs. Angular Displacement

PACKAGE DIMENSIONS in millimeters







technical drawings according to DIN specifications

Drawing-No.: 6.544-5054.01-4

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