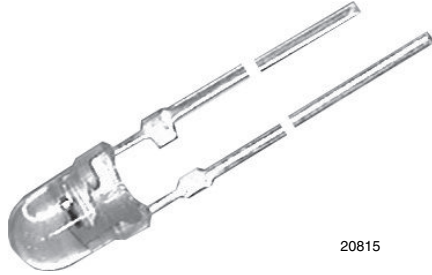


## Silicon NPN Phototransistor



### FEATURES

- Package type: leaded
- Package form: T-1
- Dimensions (in mm):  $\varnothing$  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](http://www.vishay.com/doc?99912)



### 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.

### APPLICATIONS

- Detector in electronic control and drive circuits

### PRODUCT SUMMARY

COMPONENT	$I_{ca}$ (mA)	$\varphi$ (deg)	$\lambda_{0.1}$ (nm)
BPW85	0.8 to 8	$\pm 25$	450 to 1080
BPW85A	0.8 to 2.5	$\pm 25$	450 to 1080
BPW85B	1.5 to 4	$\pm 25$	450 to 1080
BPW85C	3 to 8	$\pm 25$	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 ( $T_{amb} = 25^\circ\text{C}$ , 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	$t_p/T = 0.5, t_p \leq 10$ ms	$I_{CM}$	100	mA
Power dissipation	$T_{amb} \leq 55^\circ\text{C}$	$P_V$	100	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	$t \leq 3$ s, 2 mm from case	$T_{sd}$	260	$^\circ\text{C}$
Thermal resistance junction/ambient	Connected with Cu wire $\varnothing$ 0.14 mm <sup>2</sup>	$R_{thJA}$	450	K/W

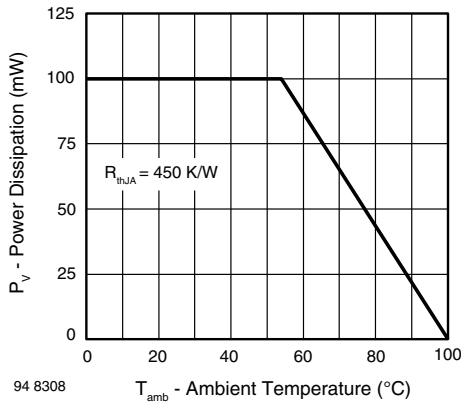


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

<b>BASIC CHARACTERISTICS</b> (T <sub>amb</sub> = 25 °C, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Collector emitter breakdown voltage	I <sub>C</sub> = 1 mA	V <sub>(BR)CEO</sub>	70			V
Collector emitter dark current	V <sub>CE</sub> = 20 V, E = 0	I <sub>CEO</sub>		1	200	nA
Collector emitter capacitance	V <sub>CE</sub> = 5 V, f = 1 MHz, E = 0	C <sub>CEO</sub>		3		pF
Angle of half sensitivity		φ		± 25		deg
Wavelength of peak sensitivity		λ <sub>p</sub>		850		nm
Range of spectral bandwidth		λ <sub>0.1</sub>		450 to 1080		nm
Collector emitter saturation voltage	E <sub>e</sub> = 1 mW/cm <sup>2</sup> , λ = 950 nm, I <sub>C</sub> = 0.1 mA	V <sub>CEsat</sub>			0.3	V
Turn-on time	V <sub>S</sub> = 5 V, I <sub>C</sub> = 5 mA, R <sub>L</sub> = 100 Ω	t <sub>on</sub>		2.0		μs
Turn-off time	V <sub>S</sub> = 5 V, I <sub>C</sub> = 5 mA, R <sub>L</sub> = 100 Ω	t <sub>off</sub>		2.3		μs
Cut-off frequency	V <sub>S</sub> = 5 V, I <sub>C</sub> = 5 mA, R <sub>L</sub> = 100 Ω	f <sub>c</sub>		180		kHz

<b>TYPE DEDICATED CHARACTERISTICS</b>							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Collector light current	E <sub>e</sub> = 1 mW/cm <sup>2</sup> , λ = 950 nm, V <sub>CE</sub> = 5 V	BPW85	I <sub>ca</sub>	0.8		8.0	mA
		BPW85A	I <sub>ca</sub>	0.8		2.5	mA
		BPW85B	I <sub>ca</sub>	1.5		4.0	mA
		BPW85C	I <sub>ca</sub>	3.0		8.0	mA



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

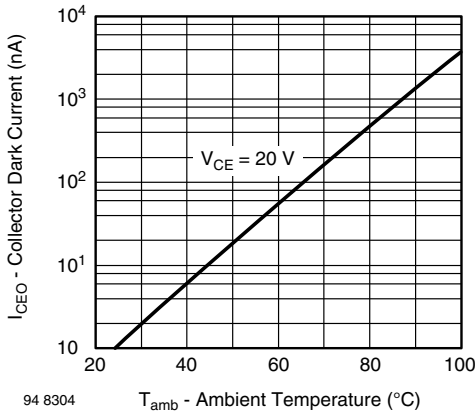


Fig. 2 - Collector Dark Current vs. Ambient Temperature

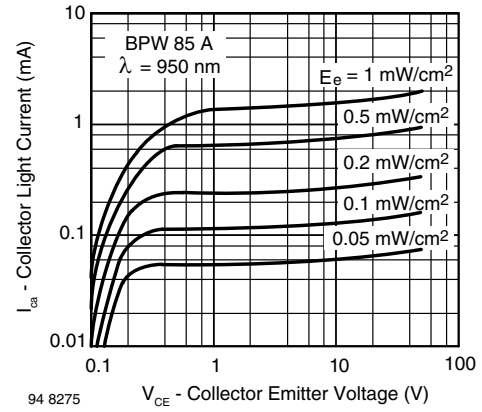


Fig. 5 - Collector Light Current vs. Collector Emitter Voltage

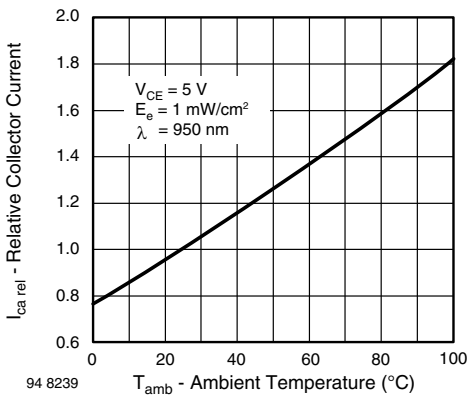


Fig. 3 - Relative Collector Current vs. Ambient Temperature

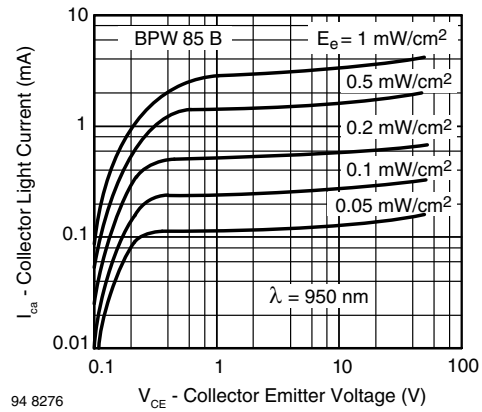


Fig. 6 - Collector Light Current vs. Collector Emitter Voltage

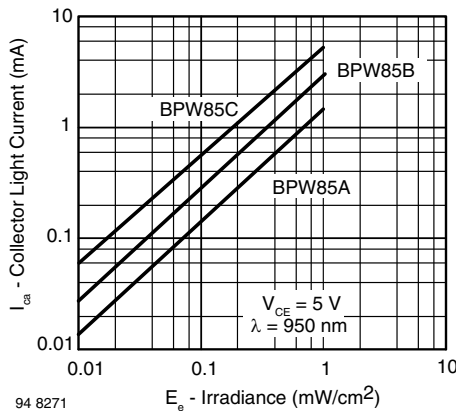


Fig. 4 - Collector Light Current vs. Irradiance

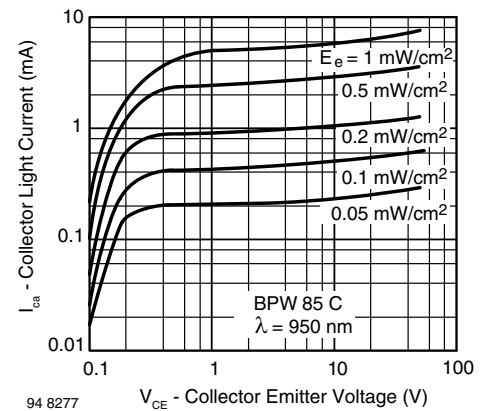


Fig. 7 - Collector Light Current vs. Collector Emitter Voltage

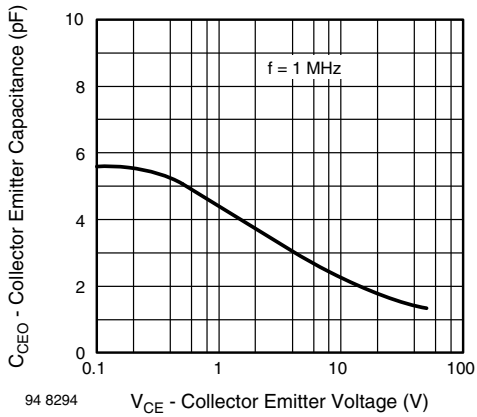


Fig. 8 - Collector Emitter Capacitance vs. Collector Emitter Voltage

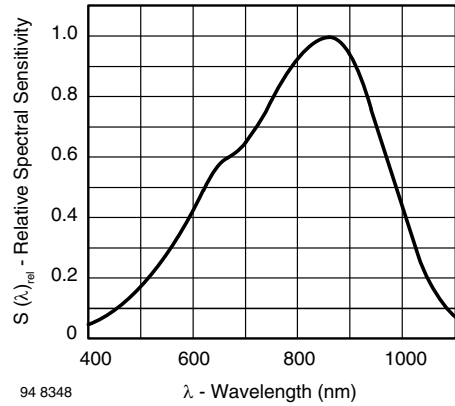


Fig. 10 - Relative Spectral Sensitivity vs. Wavelength

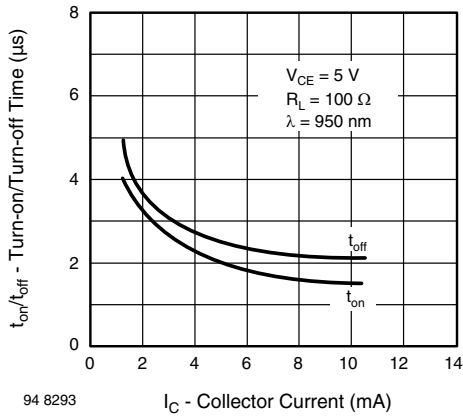


Fig. 9 - Turn-on/Turn-off Time vs. Collector Current

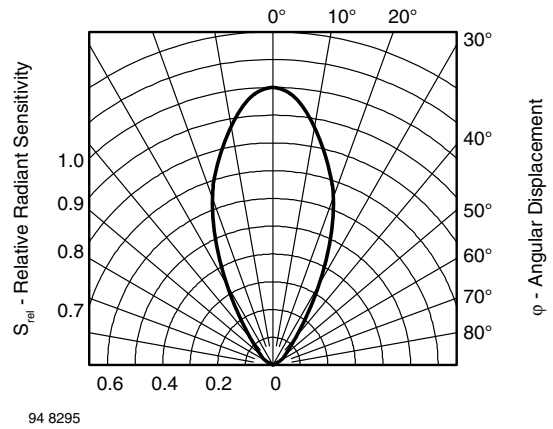
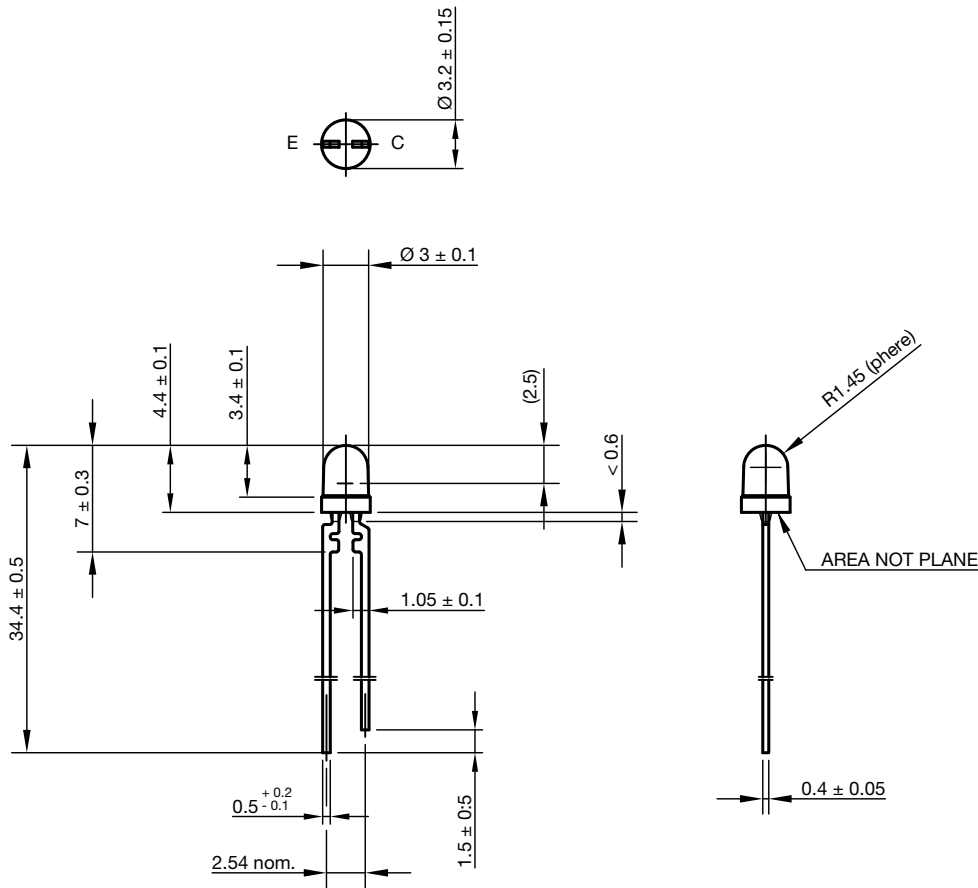


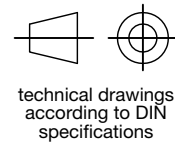
Fig. 11 - Relative Radiant Sensitivity vs. Angular Displacement



## PACKAGE DIMENSIONS in millimeters



Drawing-No.: 6.544-5054.01-4  
Issue: 5; 28.07.14





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