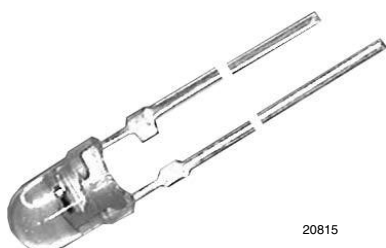


## Silicon NPN Phototransistor, RoHS Compliant



### 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.

### 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:  $\varphi = \pm 25^\circ$
- Lead (Pb)-free component in accordance with RoHS 2002/95/EC and WEEE 2002/96/EC



**RoHS**  
COMPLIANT

### APPLICATIONS

- Detector in electronic control and drive circuits

### PRODUCT SUMMARY

COMPONENT	$I_{ca}$ (mA)	$\varphi$ (deg)	$\lambda_{0.1}$ (nm)
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
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

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	$T_{amb} \leq 55$ °C	$P_V$	100	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	$t \leq 3$ s, 2 mm from case	$T_{sd}$	260	°C
Thermal resistance junction/ambient	Connected with Cu wire $\varnothing 0.14$ mm <sup>2</sup>	$R_{thJA}$	450	K/W

#### Note

$T_{amb} = 25$  °C, unless otherwise specified

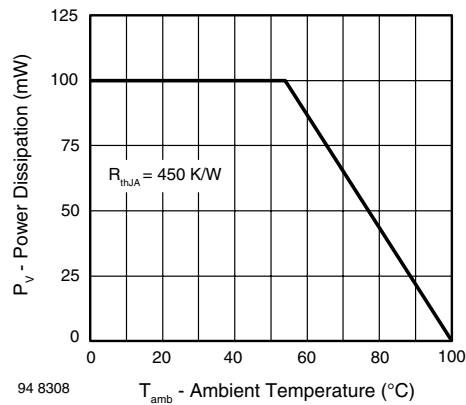


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

**BASIC CHARACTERISTICS**

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	$V_{CE} = 20 \text{ V}, E = 0$	$I_{CEO}$		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		$\phi$		$\pm 25$		deg
Wavelength of peak sensitivity		$\lambda_p$		850		nm
Range of spectral bandwidth		$\lambda_{0.1}$		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		$\mu\text{s}$
Turn-off time	$V_S = 5 \text{ V}, I_C = 5 \text{ mA}, R_L = 100 \Omega$	$t_{off}$		2.3		$\mu\text{s}$
Cut-off frequency	$V_S = 5 \text{ V}, I_C = 5 \text{ mA}, R_L = 100 \Omega$	$f_c$		180		kHz

**Note** $T_{amb} = 25^\circ\text{C}$ , unless otherwise specified**TYPE DEDICATED CHARACTERISTICS**

PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Collector light current	$E_e = 1 \text{ mW/cm}^2, \lambda = 950 \text{ nm}, V_{CE} = 5 \text{ V}$	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

$T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified

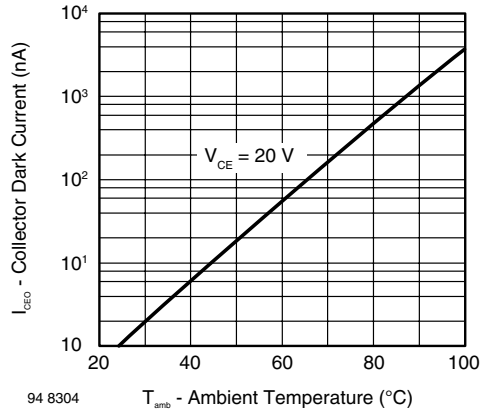


Fig. 2 - Collector Dark Current vs. Ambient Temperature

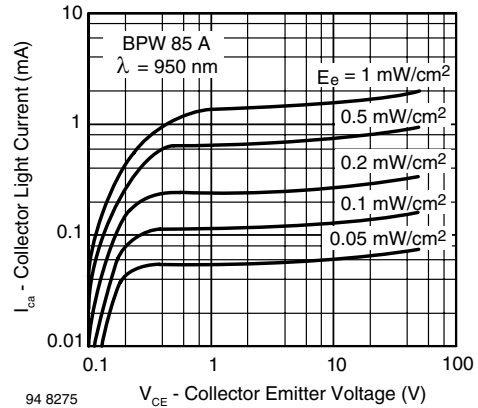


Fig. 5 - Collector Light Current vs. Collector Emitter Voltage

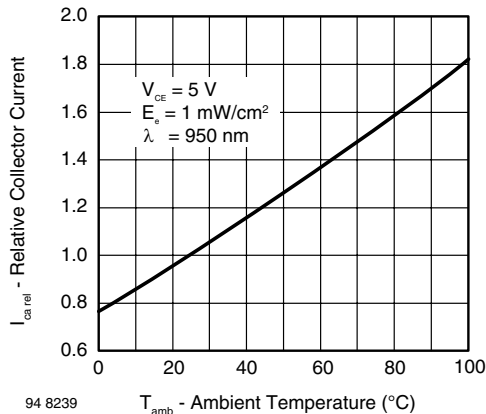


Fig. 3 - Relative Collector Current vs. Ambient Temperature

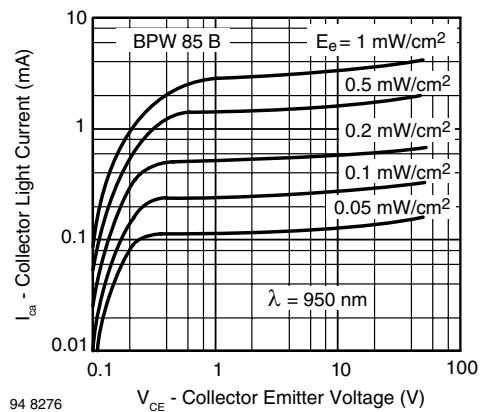


Fig. 6 - Collector Light Current vs. Collector Emitter Voltage

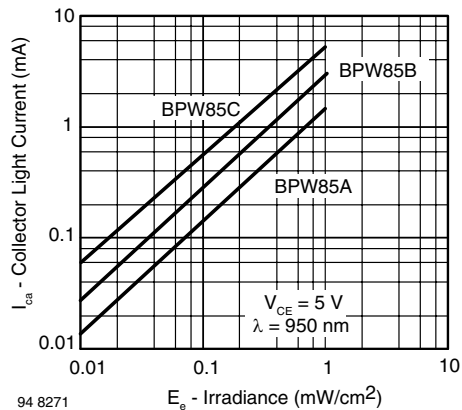


Fig. 4 - Collector Light Current vs. Irradiance

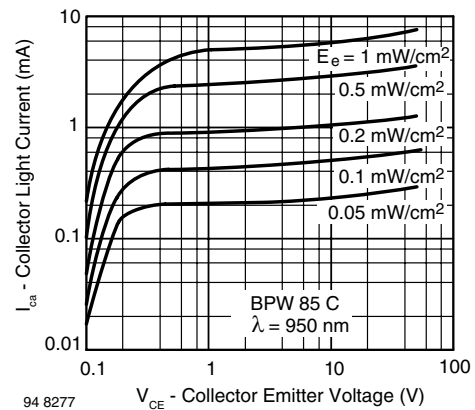


Fig. 7 - Collector Light Current vs. Collector Emitter Voltage

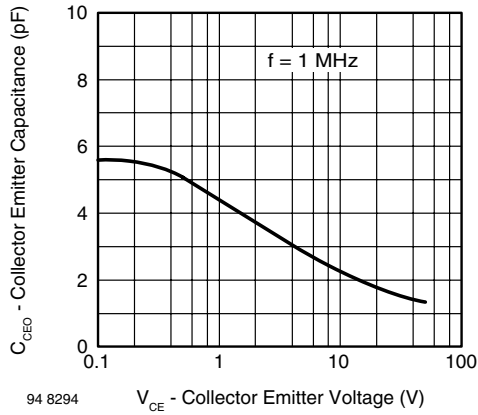


Fig. 8 - Collector Emitter Capacitance vs. Collector Emitter Voltage

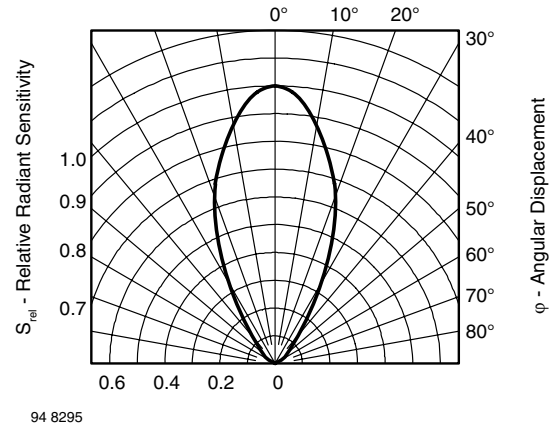


Fig. 11 - Relative Radiant Sensitivity vs. Angular Displacement

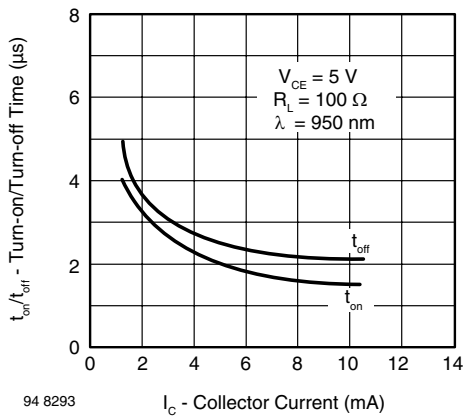


Fig. 9 - Turn-on/Turn-off Time vs. Collector Current

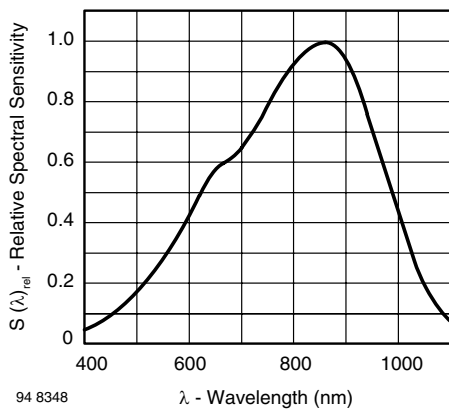


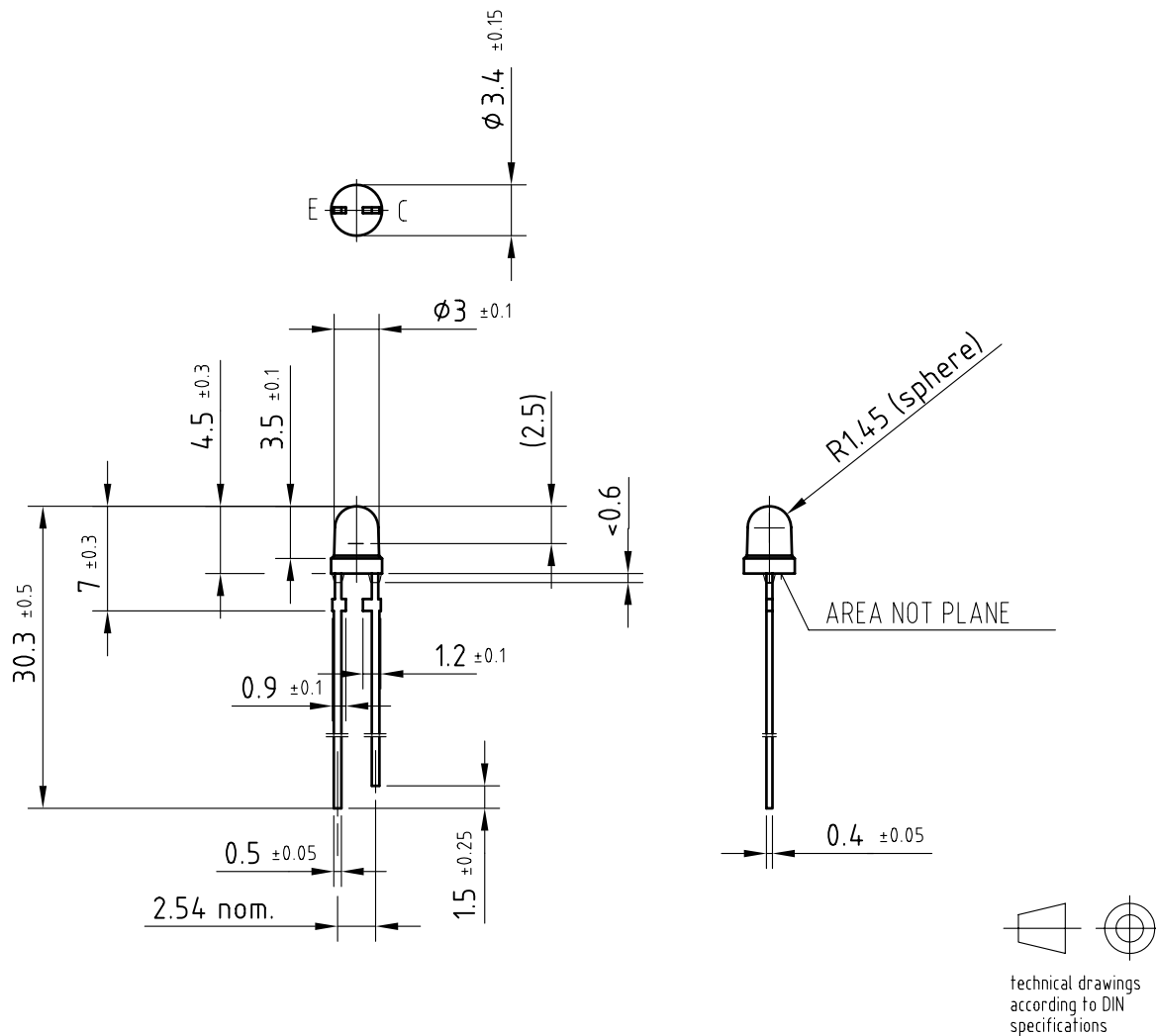
Fig. 10 - Relative Spectral Sensitivity vs. Wavelength

# BPW85A, BPW85B, BPW85C

Vishay Semiconductors Silicon NPN Phototransistor, RoHS Compliant



## PACKAGE DIMENSIONS in millimeters



Drawing-No.: 6.544-5054.01-4

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