

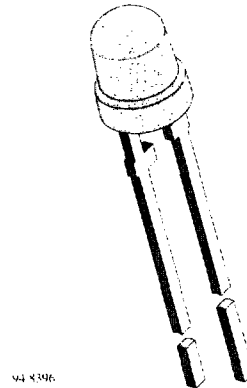
Silicon NPN Phototransistor

Description

BPW85 is a high speed and high sensitive silicon NPN epitaxial planar phototransistor in a standard T-1 (\varnothing 3 mm) plastic package. Due to its waterclear epoxy the device is sensitive to visible and near infrared radiation. The viewing angle of $\pm 25^\circ$ makes it insensible to ambient straylight.

Features

- Fast response times
- High photo sensitivity
- Standard T-1 (\varnothing 3 mm) clear plastic package
- Axial terminals
- Angle of half sensitivity $\phi = \pm 25^\circ$
- Suitable for visible and near infrared radiation



Applications

Detector in electronic control and drive circuits

Absolute Maximum Ratings

$T_{amb} = 25^\circ\text{C}$.

Parameter	Test Conditions	Symbol	Value	Unit
Collector Emitter Voltage		V_{CEO}	70	V
Emitter Collector Voltage		V_{ECO}	5	V
Collector Current		I_C	50	mA
Peak Collector Current	$t_p/T = 0.5, t_p \leq 10 \text{ ms}$	I_{CM}	100	mA
Total Power Dissipation	$T_{amb} \leq 55^\circ\text{C}$	P_{tot}	100	mW
Junction Temperature		T_j	100	$^\circ\text{C}$
Storage Temperature Range		T_{stg}	-55...+100	$^\circ\text{C}$
Soldering Temperature	$t \leq 3 \text{ s}, 2 \text{ mm from case}$	T_{sd}	260	$^\circ\text{C}$
Thermal Resistance Junction/Ambient		R_{thJA}	450	K/W

Basic Characteristics

$T_{amb} = 25^{\circ}\text{C}$

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
Collector Emitter Breakdown Voltage	$I_C = 1\text{ mA}$	$V_{(BR)CEO}$	70			V
Collector 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		φ		± 25		deg
Wavelength of Peak Sensitivity		λ_p		850		nm
Range of Spectral Bandwidth		$\lambda_{0.5}$		620...980		nm
Collector Emitter Saturation Voltage	$E_c = 1\text{ mW/cm}^2, \lambda = 950\text{ nm}, I_C = 0.1\text{ mA}$	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

$T_{amb} = 25^{\circ}\text{C}$

Parameter	Test Conditions	Type	Symbol	Min	Typ	Max	Unit
Collector Light Current	$E_c = 1\text{ mW/cm}^2, \lambda = 950\text{ nm}, V_{CE} = 5\text{ V}$	BPW85A	I_{ca}	0.8	1.5	2.5	mA
		BPW85B	I_{ca}	1.5	2.5	4.0	mA
		BPW85C	I_{ca}	3.0	5.0	8.0	mA

Typical Characteristics ($T_{amb} = 25^{\circ}\text{C}$ unless otherwise specified)

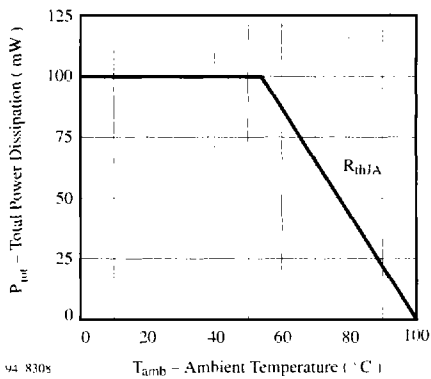


Figure 1. Total Power Dissipation vs. Ambient Temperature

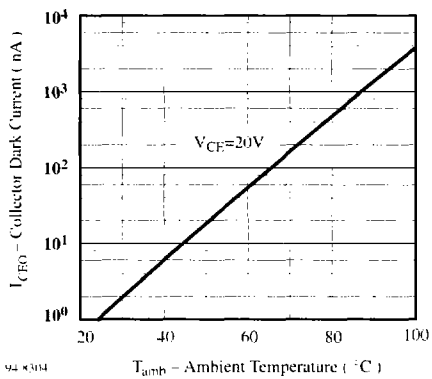


Figure 2. Collector Dark Current vs. Ambient Temperature

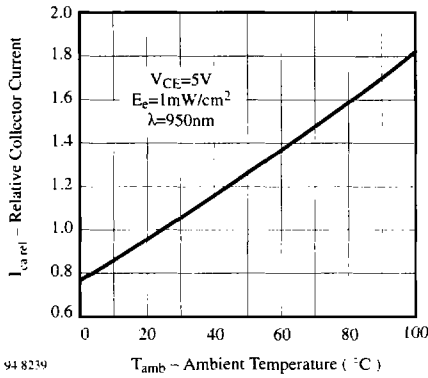


Figure 3. Relative Collector Current vs. Ambient Temperature

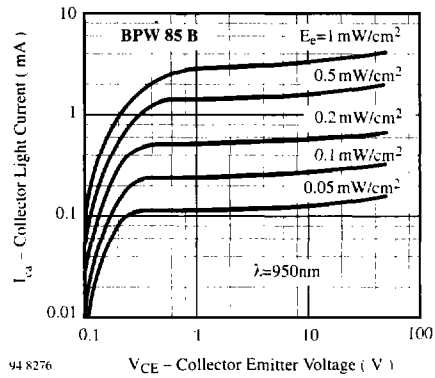


Figure 6. Collector Light Current vs. Collector Emitter Voltage

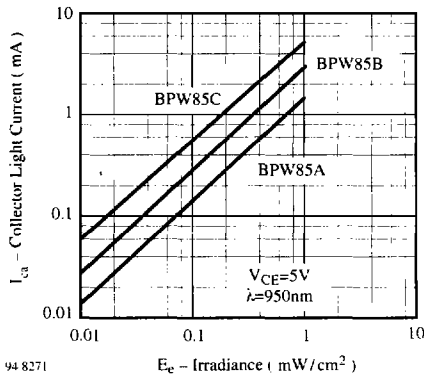


Figure 4. Collector Light Current vs. Irradiance

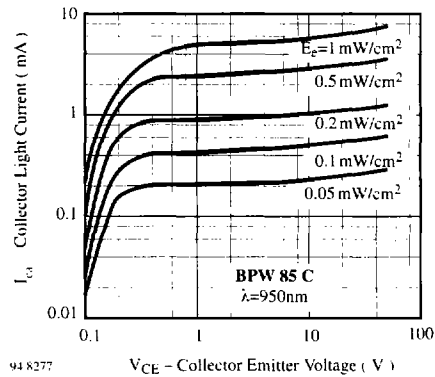


Figure 7. Collector Light Current vs. Collector Emitter Voltage

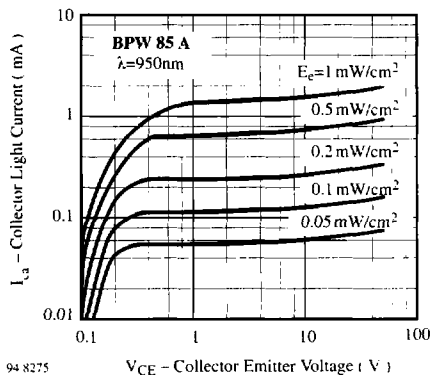


Figure 5. Collector Light Current vs. Collector Emitter Voltage

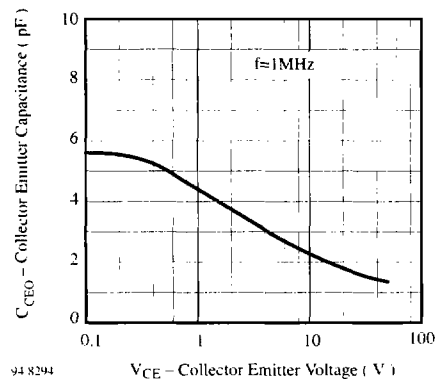


Figure 8. Collector Emitter Capacitance vs. Collector Emitter Voltage

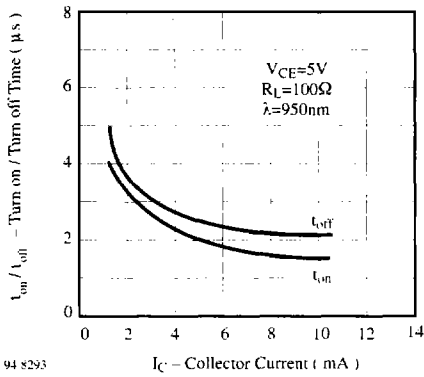


Figure 9. Turn On/Turn Off Time vs. Collector Current

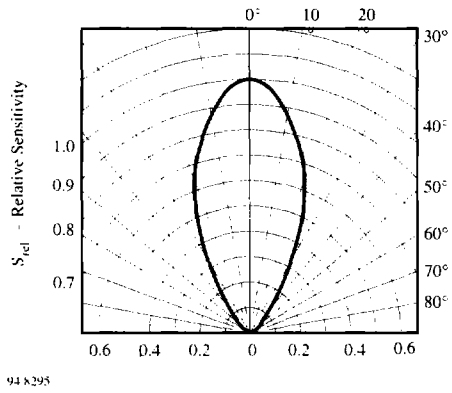


Figure 11. Relative Radiant Sensitivity vs. Angular Displacement

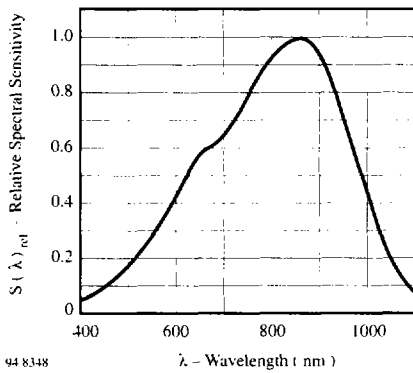
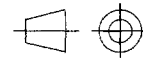
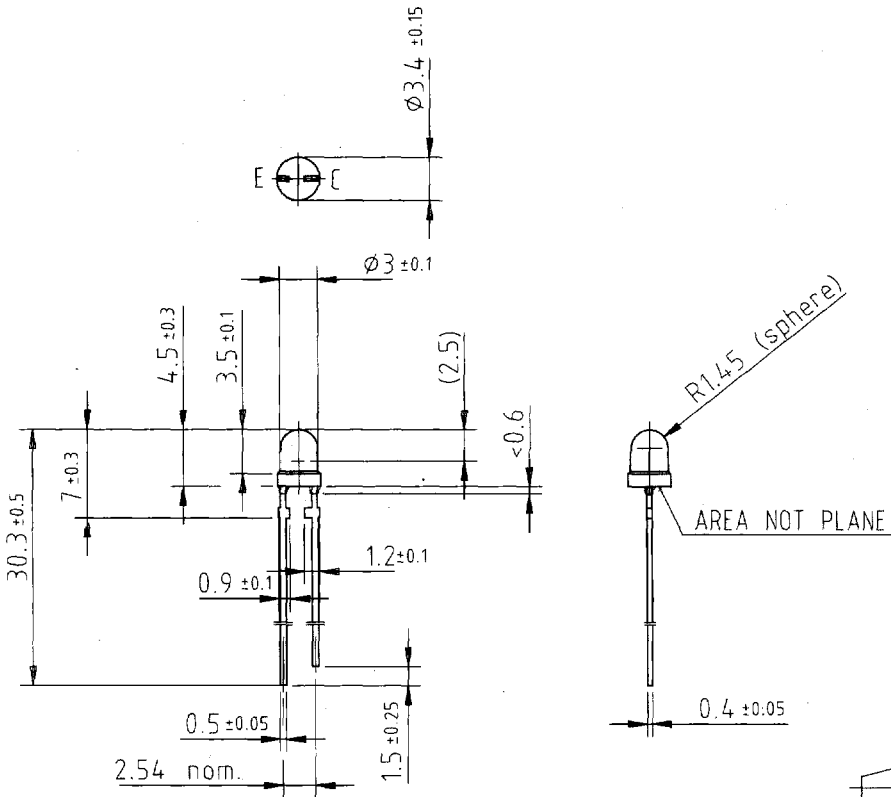


Figure 10. Relative Spectral Sensitivity vs. Wavelength

Dimensions in mm



technical drawings
according to DIN
specifications

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