

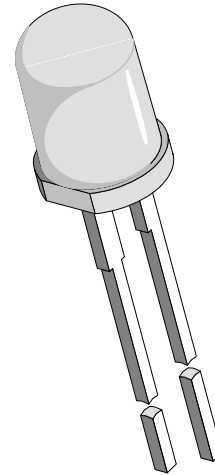
## Silicon NPN Phototransistor

### Description

BPW96 is a high speed and high sensitive silicon NPN epitaxial planar phototransistor in a standard T-1 $\frac{3}{4}$  ( $\phi$  5 mm) package.

Due to its waterclear epoxy the device is sensitive to visible and near infrared radiation.

The viewing angle of  $\pm 20^\circ$  makes it insensible to ambient straylight.



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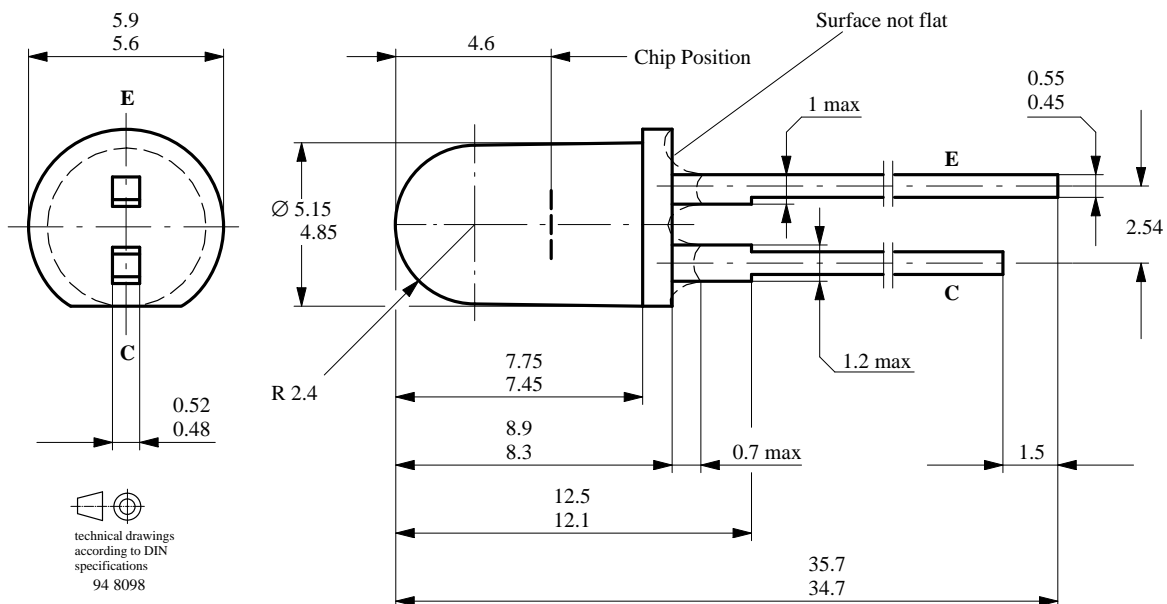
### Features

- Fast response times
- High photo sensitivity
- Standard T-1 $\frac{3}{4}$  ( $\phi$  5 mm) plastic package
- Angle of half sensitivity  $\phi = \pm 20^\circ$
- Suitable for visible and near infrared radiation

### Applications

Detector in electronic control and drive circuits

### Dimensions in mm



### 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	$T_{amb} \leq 47^{\circ}\text{C}$	$P_{tot}$	150	mW
Junction Temperature		$T_j$	100	$^{\circ}\text{C}$
Storage Temperature Range		$T_{stg}$	-55...+100	$^{\circ}\text{C}$
Soldering Temperature	$t \leq 3 \text{ s}$	$T_{sd}$	260	$^{\circ}\text{C}$
Thermal Resistance Junction/Ambient		$R_{thJA}$	350	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		$\phi$		$\pm 20$		deg
Wavelength of Peak Sensitivity		$\lambda_p$		850		nm
Range of Spectral Bandwidth		$\lambda_{0.5}$		620...980		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

### Type Dedicated Characteristics

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

Parameter	Type	Test Conditions	Symbol	Min	Typ	Max	Unit
Collector Light Current	BPW96A	$E_e = 1 \text{ mW/cm}^2, \lambda = 950 \text{ nm}, V_{CE} = 5 \text{ V}$	$I_{ca}$	1.5	2.5	4.5	mA
	BPW96B	$E_e = 1 \text{ mW/cm}^2, \lambda = 950 \text{ nm}, V_{CE} = 5 \text{ V}$	$I_{ca}$	2.5	4.5	7.5	mA
	BPW96C	$E_e = 1 \text{ mW/cm}^2, \lambda = 950 \text{ nm}, V_{CE} = 5 \text{ V}$	$I_{ca}$	4.5	8	15	mA

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

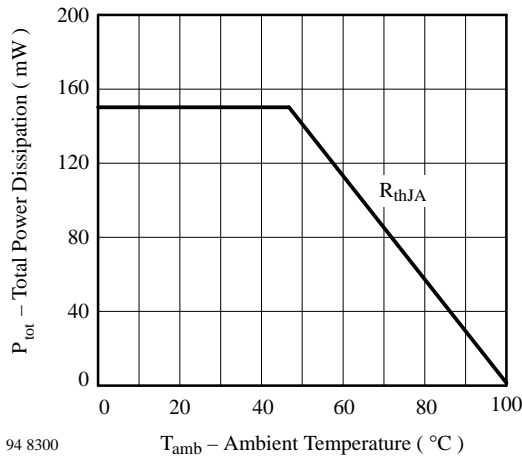


Figure 1 : Total Power Dissipation vs. Ambient Temperature

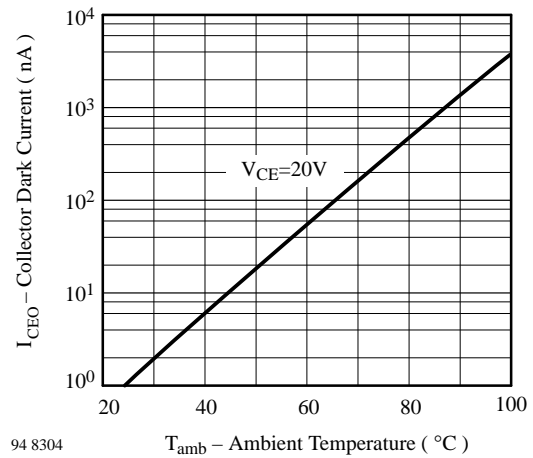


Figure 2 : Collector Dark Current vs. Ambient Temperature

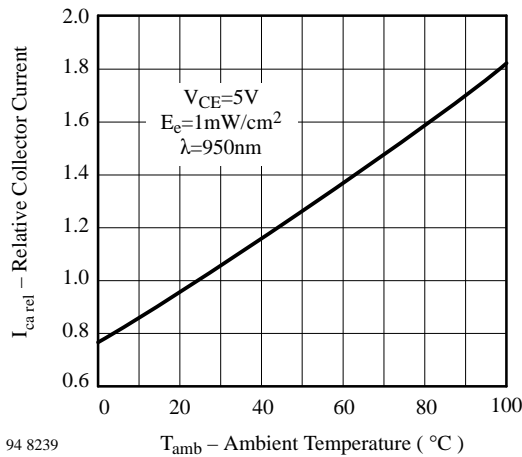


Figure 3 : Relative Collector Current vs. Ambient Temperature

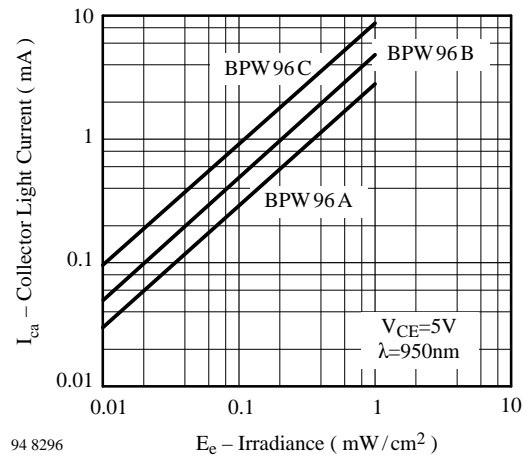


Figure 4 : Collector Light Current vs. Irradiance

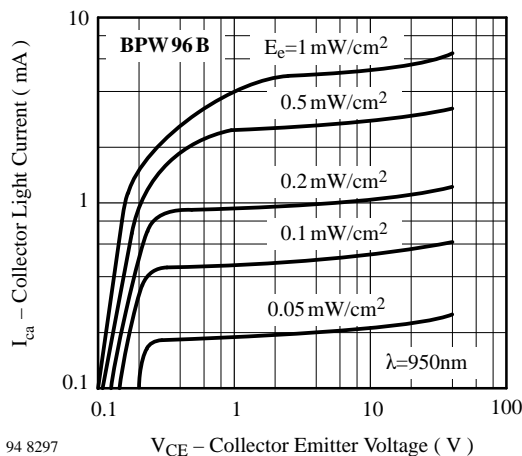


Figure 5 : Collector Light Current vs. Collector Emitter Voltage

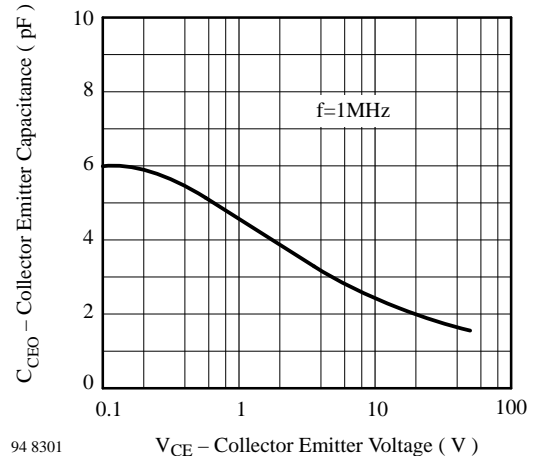
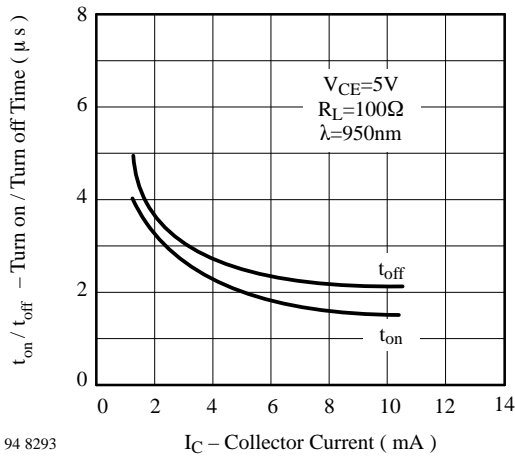
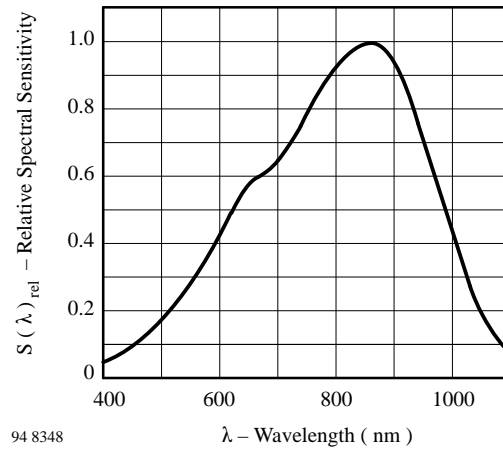


Figure 6 : Collector Emitter Capacitance vs. Collector Emitter Voltage



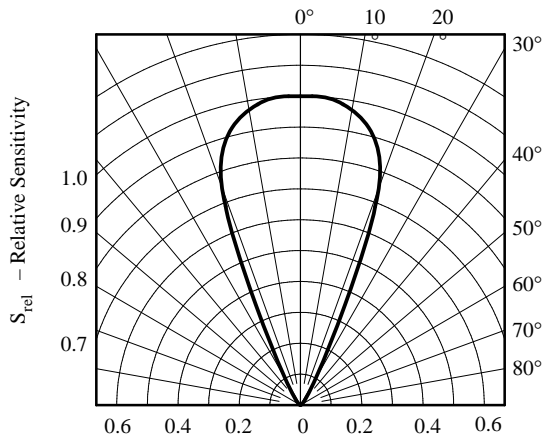
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Figure 7 : Turn On/Turn Off Time vs. Collector Current



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Figure 8 : Relative Spectral Sensitivity vs. Wavelength



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Figure 9 : Relative Radiant Sensitivity vs. Angular Displacement

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