

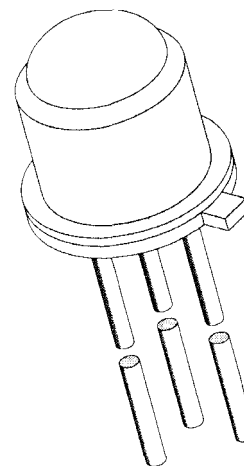
Silicon NPN Phototransistor

Description

BPW77N is a very high sensitive silicon NPN epitaxial planar phototransistor in a standard TO-18 hermetically sealed metal case.

Its glass lens featuring a viewing angle of $\pm 10^\circ$ makes it insensible to ambient straylight.

A base terminal is available to enable biasing and sensitivity control.



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Features

- Hermetically sealed case
- Lens window
- Narrow viewing angle $\varphi = \pm 10^\circ$
- Exact central chip alignment
- Base terminal available
- High photo sensitivity
- Suitable for visible and near infrared radiation
- Selected into sensitivity groups

Applications

Detector in electronic control and drive circuits

Absolute Maximum Ratings

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

Parameter	Test Conditions	Symbol	Value	Unit
Collector Base Voltage		V_{CBO}	80	V
Collector Emitter Voltage		V_{CEO}	70	V
Emitter Base Voltage		V_{EBO}	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	$T_{amb} \leq 25^\circ\text{C}$	P_{tot}	250	mW
Junction Temperature		T_j	125	$^\circ\text{C}$
Storage Temperature Range		T_{stg}	-55...+125	$^\circ\text{C}$
Soldering Temperature	$t \leq 5 \text{ s}$	T_{sd}	260	$^\circ\text{C}$
Thermal Resistance Junction/Ambient		R_{thJA}	400	K/W
Thermal Resistance Junction/Case		R_{thJC}	150	K/W

Basic Characteristics

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

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
Collector Emitter Breakdown Voltage	$I_C = 1\text{ mA}$	$V_{(BR)CE}$	70			V
Collector Dark Current	$V_{CE} = 20\text{ V}, E = 0$	I_{CEO}		1	100	nA
Collector Emitter Capacitance	$V_{CE} = 5\text{ V}, f = 1\text{ MHz}, E = 0$	C_{CEO}		6		pF
Angle of Half Sensitivity		ϕ		± 10		deg
Wavelength of Peak Sensitivity		λ_p		850		nm
Range of Spectral Bandwidth		$\lambda_{0.5}$		620...980		nm
Collector Emitter Saturation Voltage	$E_e = 1\text{ mW/cm}^2$, $\lambda = 950\text{ nm}, I_C = 1\text{ mA}$	V_{CEsat}		0.15	0.3	V
Turn-On Time	$V_S = 5\text{ V}, I_C = 5\text{ mA}$, $R_L = 100\ \Omega$	t_{on}		6		μs
Turn-Off Time	$V_S = 5\text{ V}, I_C = 5\text{ mA}$, $R_L = 100\ \Omega$	t_{off}		5		μs
Cut-Off Frequency	$V_S = 5\text{ V}, I_C = 5\text{ mA}$, $R_L = 100\ \Omega$	f_c		110		kHz

Type Dedicated Characteristics

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

Parameter	Test Conditions	Type	Symbol	Min	Typ	Max	Unit
Collector Light Current	$E_e = 1\text{ mW/cm}^2$, $\lambda = 950\text{ nm}, V_{CE} = 5\text{ V}$	BPW77NA	I_{ca}	7.5	10	15	mA
		BPW77NB	I_{ca}	10	20		mA

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

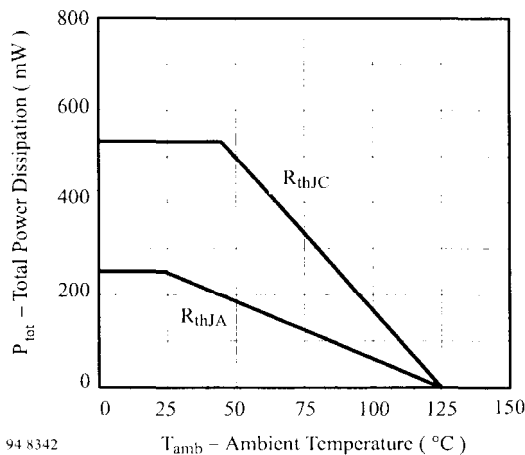


Figure 1. Total Power Dissipation vs. Ambient Temperature

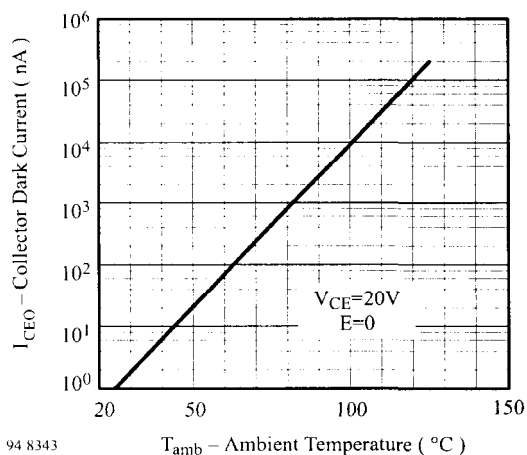


Figure 2. Collector Dark Current vs. Ambient Temperature

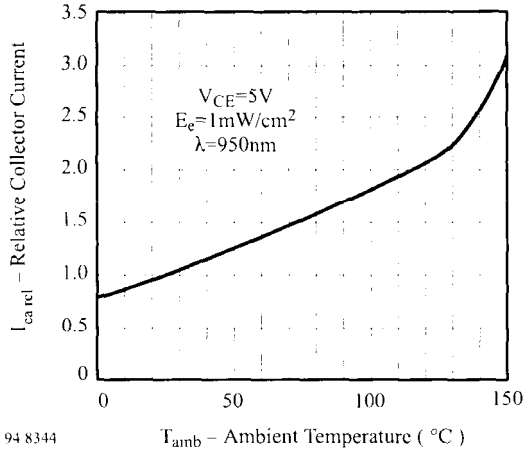


Figure 3. Relative Collector Current vs. Ambient Temperature

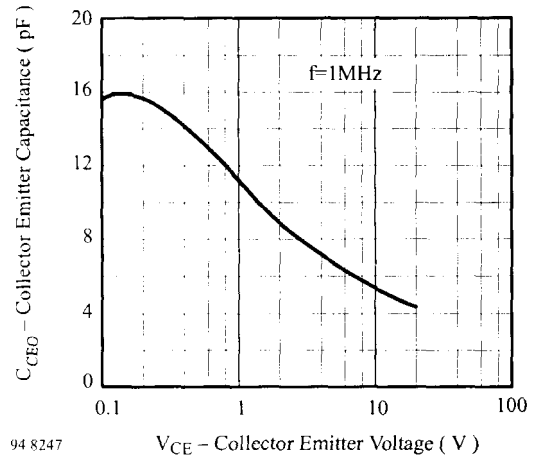


Figure 6. Collector Emitter Capacitance vs. Collector Emitter Voltage

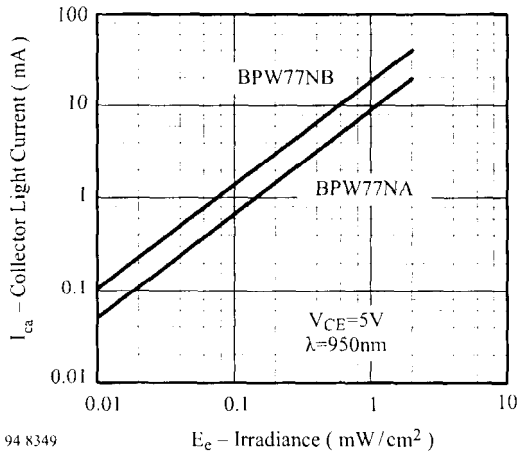


Figure 4. Collector Light Current vs. Irradiance

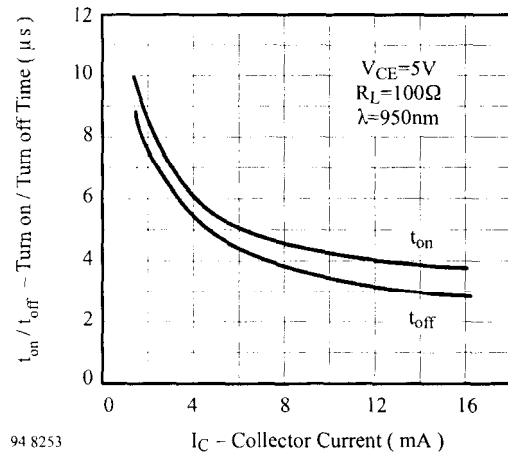


Figure 7. Turn On/Turn Off Time vs. Collector Current

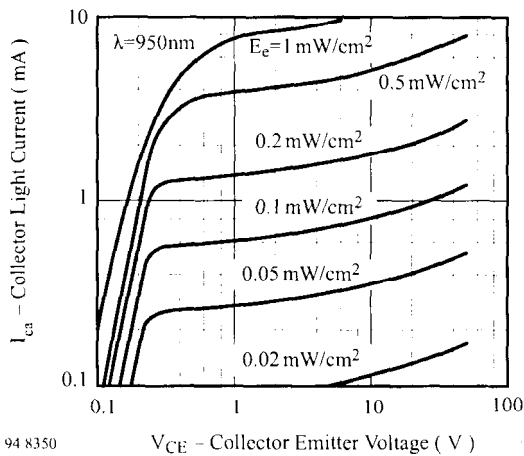


Figure 5. Collector Light Current vs. Collector Emitter Voltage

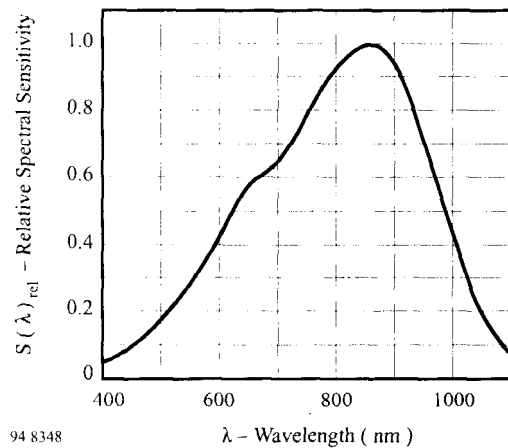
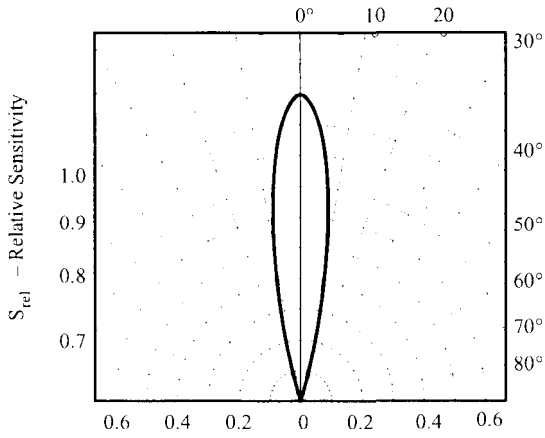


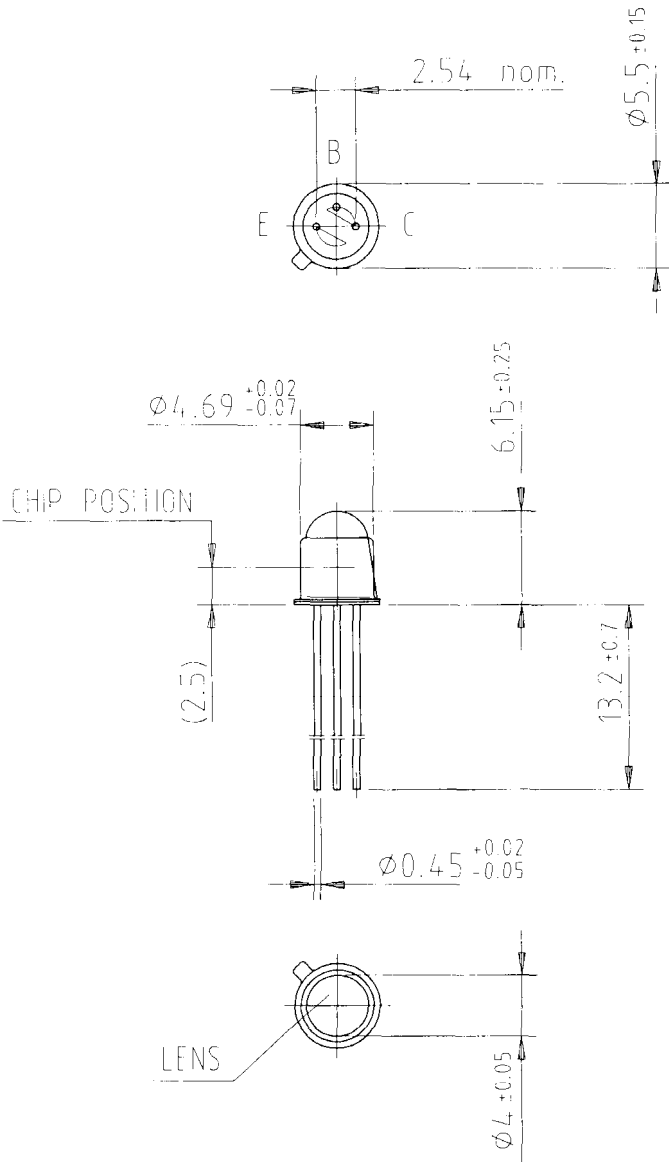
Figure 8. Relative Spectral Sensitivity vs. Wavelength



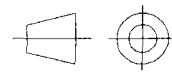
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Figure 9. Relative Radiant Sensitivity vs. Angular Displacement

Dimensions in mm



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technical drawings
according to DIN
specifications