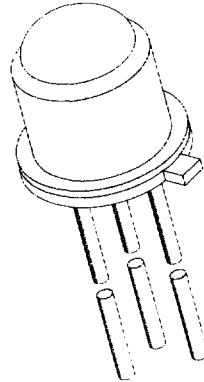


Silicon NPN Phototransistor

Description

S254PN is a high speed and 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
- Narrow viewing angle $\varphi = \pm 10^\circ$
- Exact central chip alignment
- Base terminal available
- High photo sensitivity
- Fast response times
- 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 Base Voltage		V_{CBO}	45	V
Collector Emitter Voltage		V_{CEO}	45	V
Emitter Base Voltage		V_{EBO}	5	V
Collector Current		I_C	50	mA
Peak Collector Current	$t_p/T = 0.05, t_p \leq 10 \text{ ms}$	I_{CM}	100	mA
Total Power Dissipation	$T_{amb} \leq 25^\circ\text{C}$	P_{tot}	310	mW
Junction Temperature		T_j	150	$^\circ\text{C}$
Storage Temperature Range		T_{stg}	-55...+150	$^\circ\text{C}$
Thermal Resistance Junction/Ambient		R_{thJA}	400	K/W
Thermal Resistance Junction/Case		R_{thJC}	150	K/W

Basic Characteristics

T_{amb} = 25°C

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
Collector Emitter Breakdown Voltage	I _C = 1 mA	V _{i(BR)CEO}	45			V
Collector Dark Current	V _{CE} = 20 V, E = 0	I _{CEO}		1	100	nA
Collector Emitter Capacitance	V _{CE} = 5 V, f = 1 MHz, E=0	C _{CEO}		3		pF
Collector Light Current	E _c =1mW/cm ² , λ=950nm, V _{CE} =5V	I _{ca}	3			mA
Angle of Half Sensitivity		φ		±10		deg
Wavelength of Peak Sensitivity		λ _p		850		nm
Range of Spectral Bandwidth		λ _{0.5}		620..980		nm
Collector Emitter Saturation Voltage	E _c =1mW/cm ² , λ=950nm, I _C =0.1mA.	V _{CEsat}			0.3	V
Turn-On Time	V _S =5V, I _C =5mA, R _L =100Ω	t _{on}		2.1		μs
Turn-Off Time	V _S =5V, I _C =5mA, R _L =100Ω	t _{off}		2.3		μs
Cut-Off Frequency	V _S =5V, I _C =5mA, R _L =100Ω	f _c		170		kHz

Typical Characteristics (T_{amb} = 25°C unless otherwise specified)

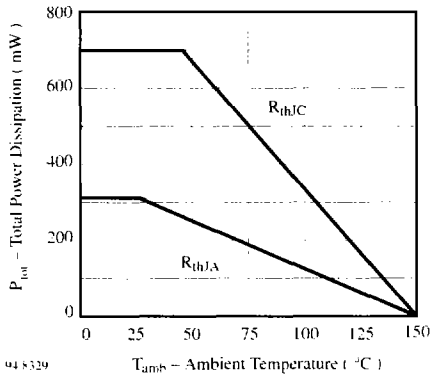


Figure 1. Total Power Dissipation vs. Ambient Temperature

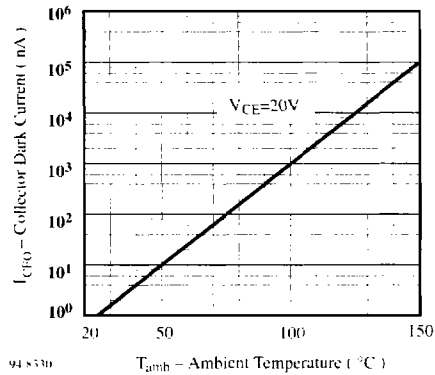


Figure 2. Collector Dark Current vs. Ambient Temperature

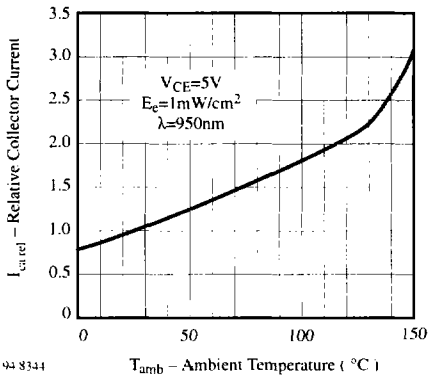


Figure 3. Relative Collector Current vs. Ambient Temperature

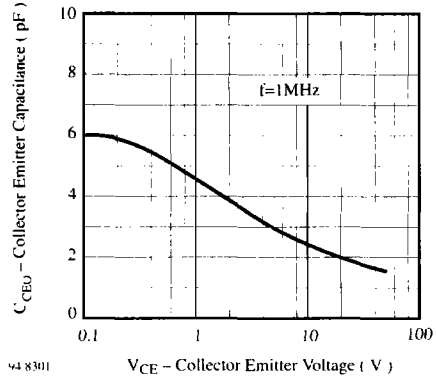


Figure 6. Collector Emitter Capacitance vs. Collector Emitter Voltage

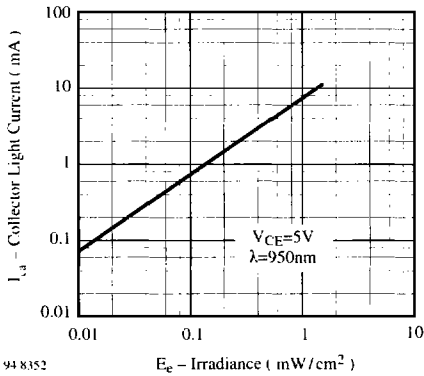


Figure 4. Collector Light Current vs. Irradiance

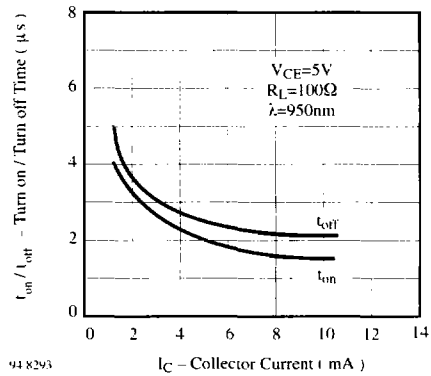


Figure 7. Turn On/Turn Off Time vs. Collector Current

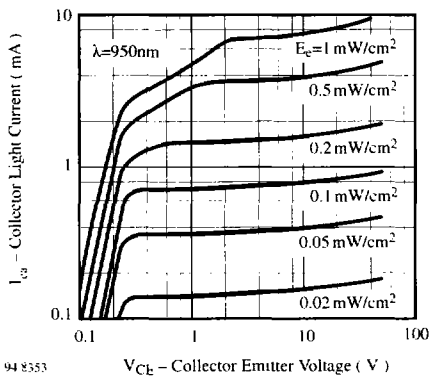


Figure 5. Collector Light Current vs. Collector Emitter Voltage

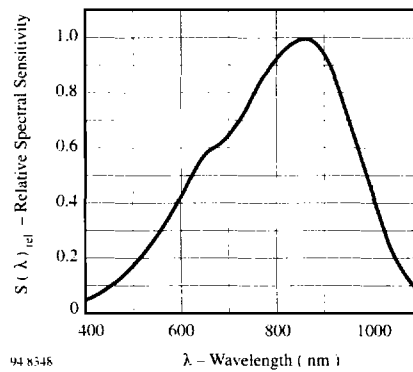
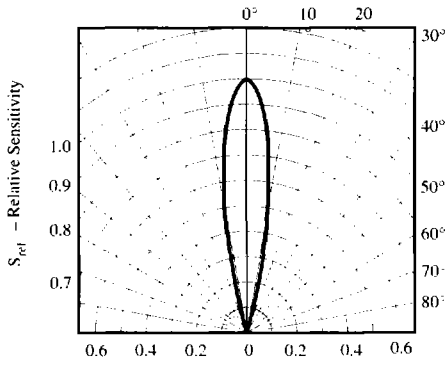


Figure 8. Relative Spectral Sensitivity vs. Wavelength

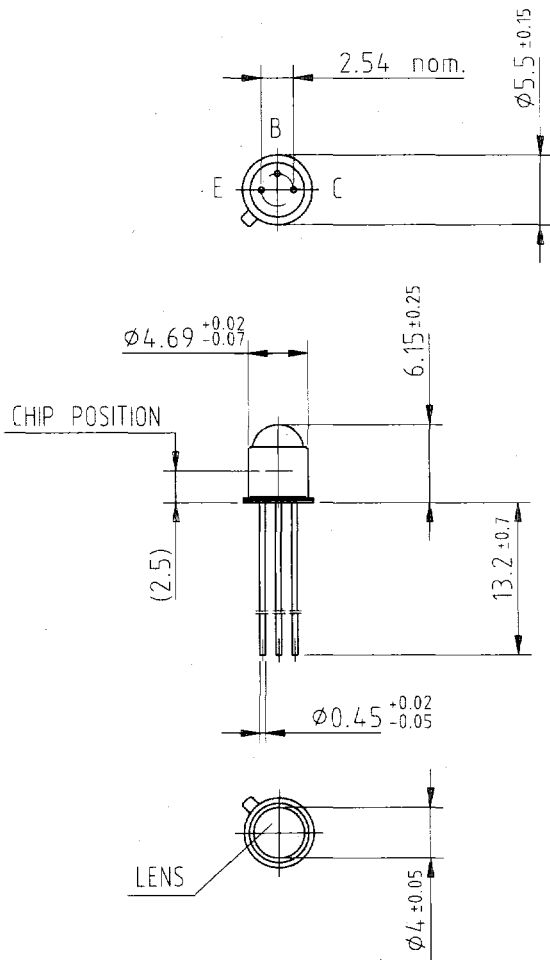


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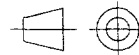
Figure 9. Relative Radiant Sensitivity vs. Angular Displacement



Dimensions in mm



96 12180



technical drawings
according to DIN
specifications