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### Silicon Darlington Phototransistor

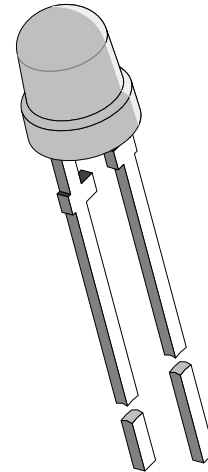
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#### Description

S 289 P is an extra high sensitive monolithic silicon epitaxial planar Darlington phototransistor in a standard T-1 ( $\varnothing$  3 mm) package.

The epoxy package itself is an IR filter, spectrally matched to GaAs IR emitters with  $\lambda_p > 850\text{nm}$ .

A plastic lens provides a wide viewing angle of  $\pm 30^\circ$ .



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#### Features

- Extra high radiant sensitivity
- Very low temperature drift
- Standard T-1 ( $\varnothing$  3 mm) package with IR filter
- Wide viewing angle  $\varphi = \pm 30^\circ$
- Suitable for near infrared radiation

#### Applications

Any applications requiring high sensitivity at low light levels e.g.  
Direct driving of relays and small motors  
Special light barriers and switches

### Absolute Maximum Ratings

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

Parameter	Test Conditions	Symbol	Value	Unit
Collector Emitter Voltage		$V_{CEO}$	40	V
Collector Current		$I_C$	0.1	A
Peak Collector Current	$t_p/T = 0.05, t_p \leq 10 \text{ ms}$	$I_{CM}$	1	A
Total Power Dissipation	$T_{amb} \leq 25^{\circ}\text{C}$	$P_{tot}$	185	mW
Junction Temperature		$T_j$	100	$^{\circ}\text{C}$
Operating Temperature Range		$T_{amb}$	-55...+100	$^{\circ}\text{C}$
Storage Temperature Range		$T_{stg}$	-55...+100	$^{\circ}\text{C}$
Soldering Temperature	$t \leq 5 \text{ s}$	$T_{sd}$	260	$^{\circ}\text{C}$
Thermal Resistance Junction/Ambient		$R_{thJA}$	400	K/W

### Basic Characteristics

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

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
Collector Emitter Breakdown Voltage	$I_C = 1 \text{ mA}$	$V_{(BR)CEO}$	40			V
Collector Dark Current	$V_{CE} = 20 \text{ V}, E = 0$	$I_{CEO}$		10	200	nA
Collector Light Current	$E_e = 0.3 \text{ mW/cm}^2, \lambda = 950 \text{ nm}, V_{CE} = 5 \text{ V}$	$I_{ca}$	4	15		mA
Angle of Half Sensitivity		$\phi$		$\pm 30$		deg
Wavelength of Peak Sensitivity		$\lambda_p$		920		nm
Range of Spectral Bandwidth		$\lambda_{0.5}$		830...1000		nm
Collector Emitter Saturation Voltage	$E_e = 0.3 \text{ mW/cm}^2, \lambda = 950 \text{ nm}, I_C = 1 \text{ mA}$	$V_{CEsat}$		0.75	1.1	V
Turn-On Time	$V_S = 5 \text{ V}, I_C = 10 \text{ mA}, R_L = 100 \Omega$	$t_{on}$		40		$\mu\text{s}$
Turn-Off Time	$V_S = 5 \text{ V}, I_C = 10 \text{ mA}, R_L = 100 \Omega$	$t_{off}$		50		$\mu\text{s}$

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

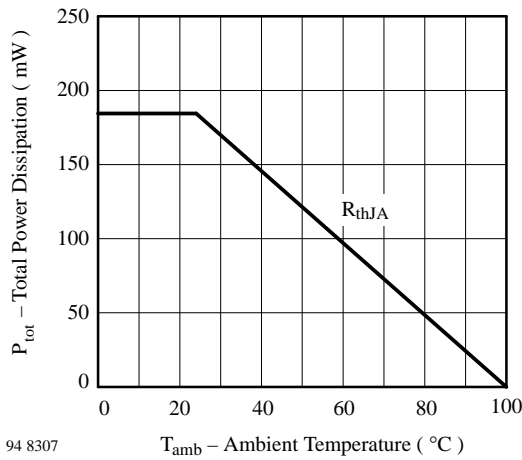


Figure 1 : Total Power Dissipation vs. Ambient Temperature

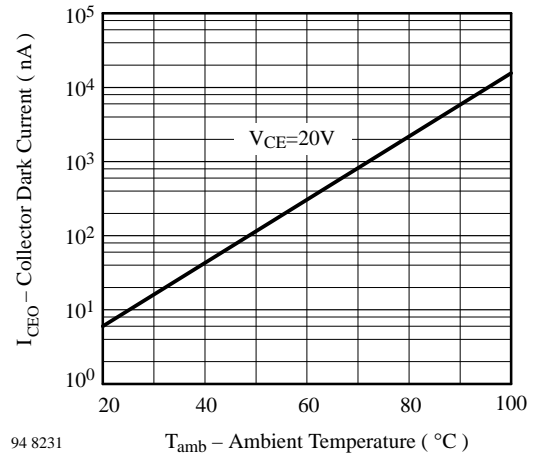


Figure 2 : Collector Dark Current vs. Ambient Temperature

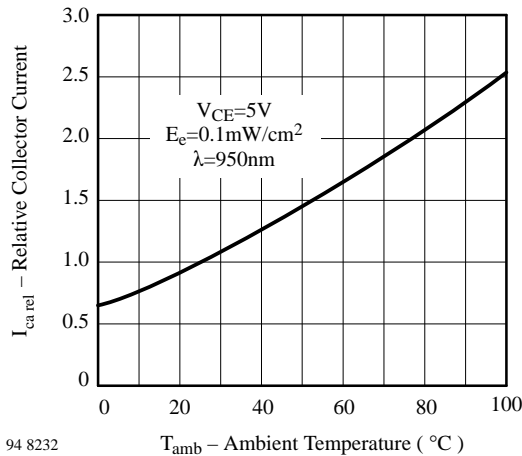


Figure 3 : Relative Collector Current vs. Ambient Temperature

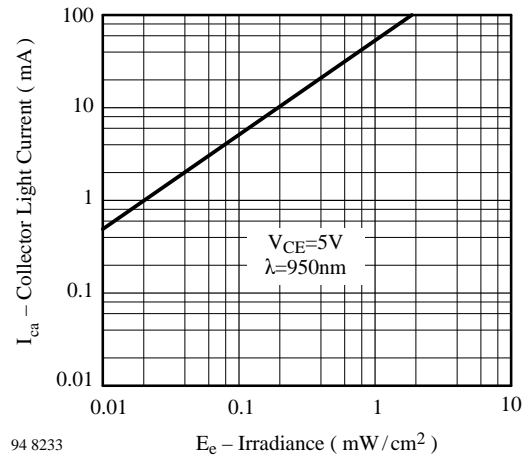


Figure 4 : Collector Light Current vs. Irradiance

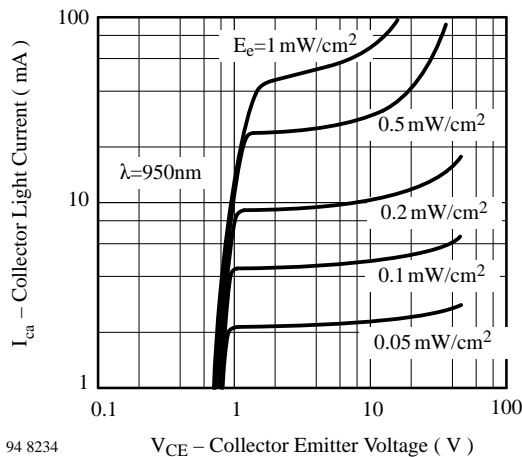


Figure 5 : Collector Light Current vs. Collector Emitter Voltage

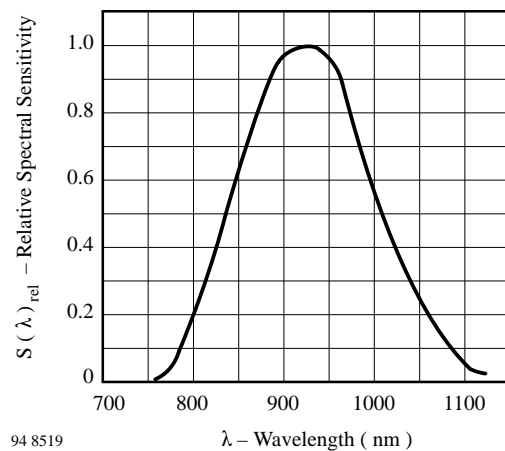
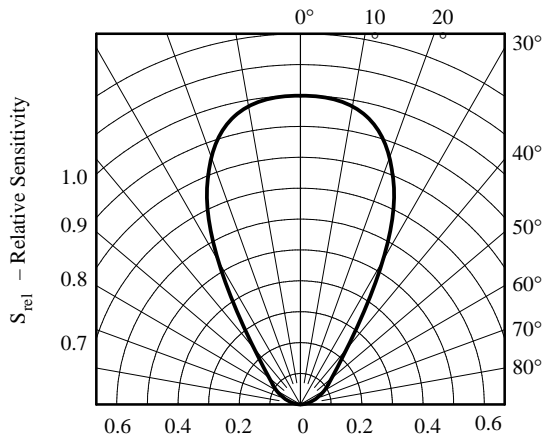


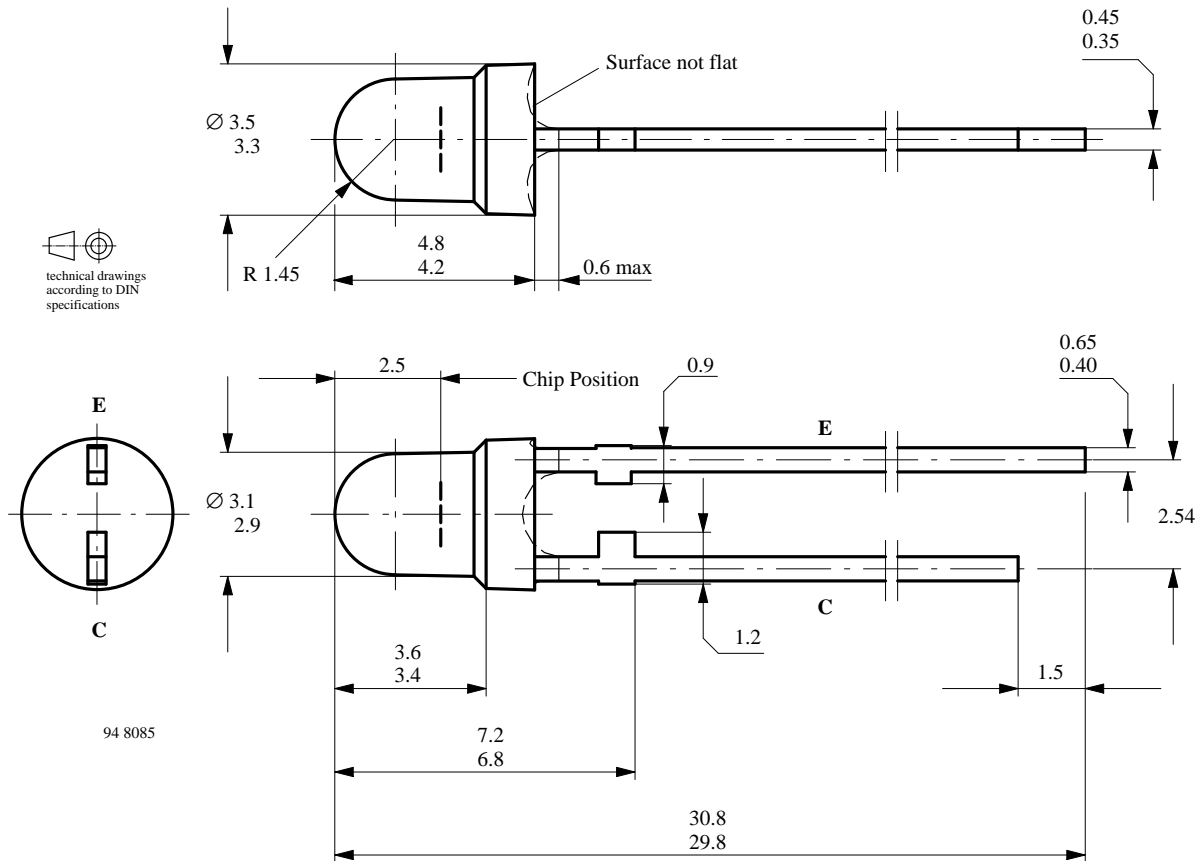
Figure 6 : Relative Spectral Sensitivity vs. Wavelength



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Figure 7 : Relative Radiant Sensitivity vs. Angular Displacement

### Dimensions in mm



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