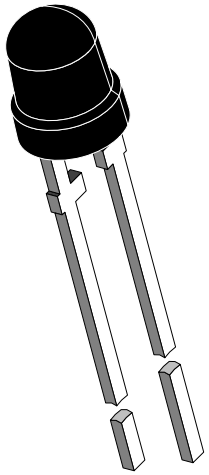
Silicon Darlington Phototransistor

Description

S289P is an extra high sensitive monolithic silicon epitaxial planar Darlington phototransistor in a standard T–1 (ø 3 mm) package.
The epoxy package itself is an IR filter, spectrally matched to GaAs IR emitters with λ_p >850nm. A plastic lens provides a wide viewing angle of ±30˚.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Features

- Extra high radiant sensitivity
- Very low temperature drift
- Standard T–1 (ø 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°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, $t_p \leqq$ 10 ms	I_{CM}	1	A
Total Power Dissipation	$T_{amb} \leqq$ 25 ˚C	P_{tot}	185	mW
Junction Temperature		T_j	100	˚C
Operating Temperature Range		T_{amb}	–55...+100	˚C
Storage Temperature Range		T_{stg}	–55...+100	˚C
Soldering Temperature	t $\leqq$ 5 s	T_{sd}	260	˚C
Thermal Resistance Junction/Ambient		R_{thJA}	400	K/W

Basic Characteristics

T_{amb} = 25°C

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

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

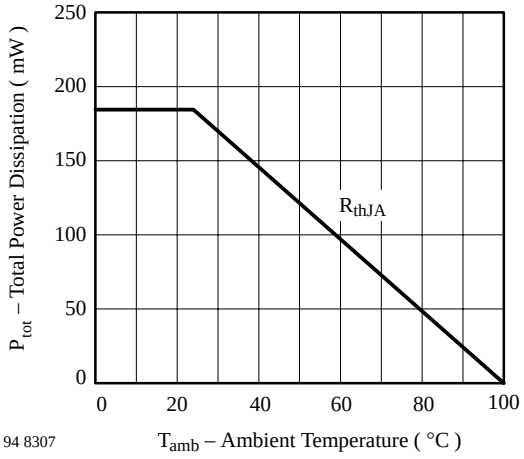


Figure 1. Total Power Dissipation vs. Ambient Temperature

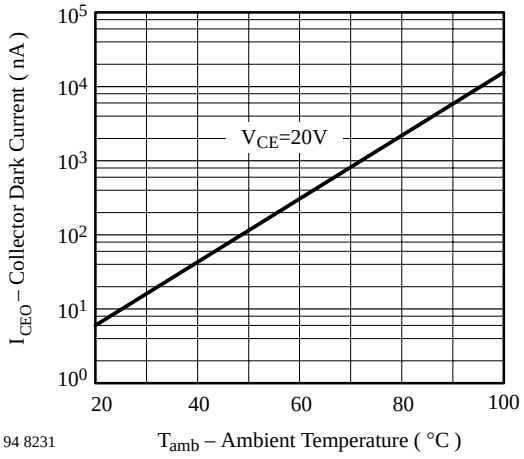


Figure 2. Collector Dark Current vs. Ambient Temperature

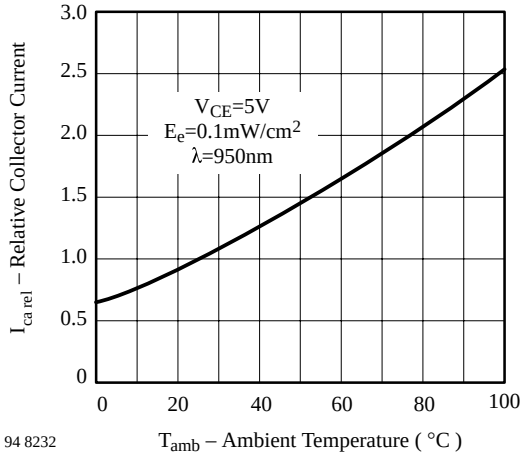


Figure 3. Relative Collector Current vs. Ambient Temperature

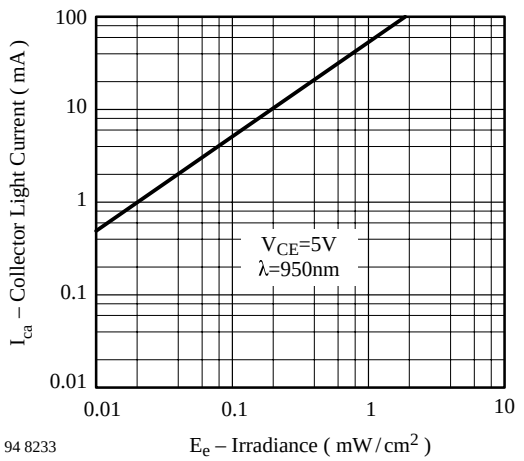


Figure 4. Collector Light Current vs. Irradiance

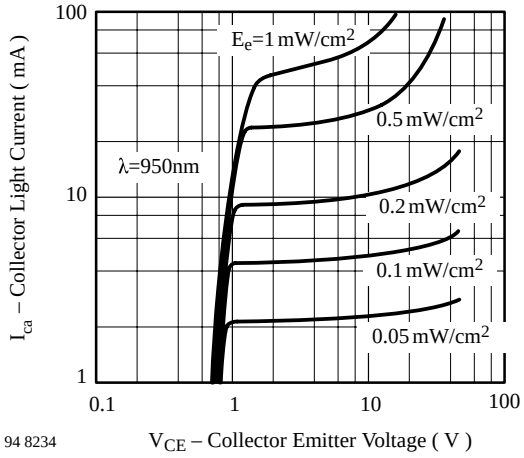


Figure 5. Collector Light Current vs. Collector Emitter Voltage

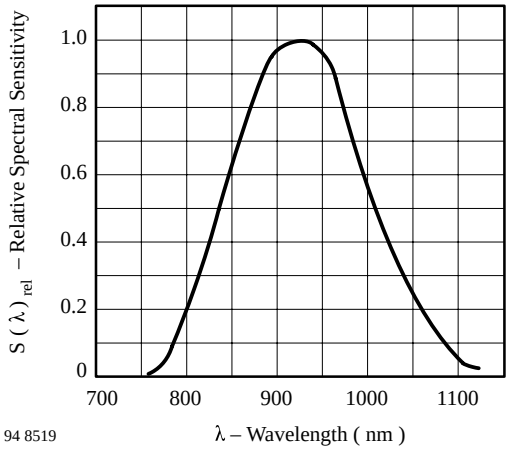


Figure 6. Relative Spectral Sensitivity vs. Wavelength

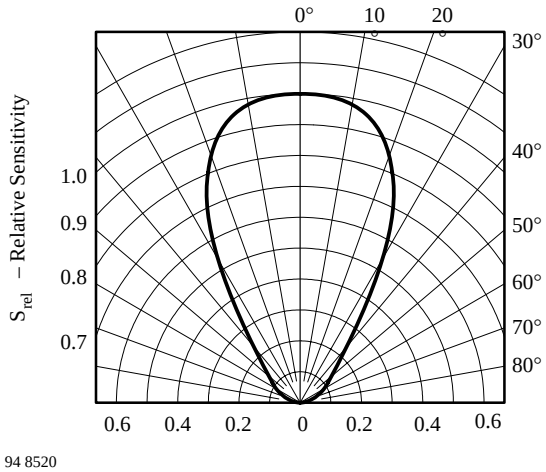
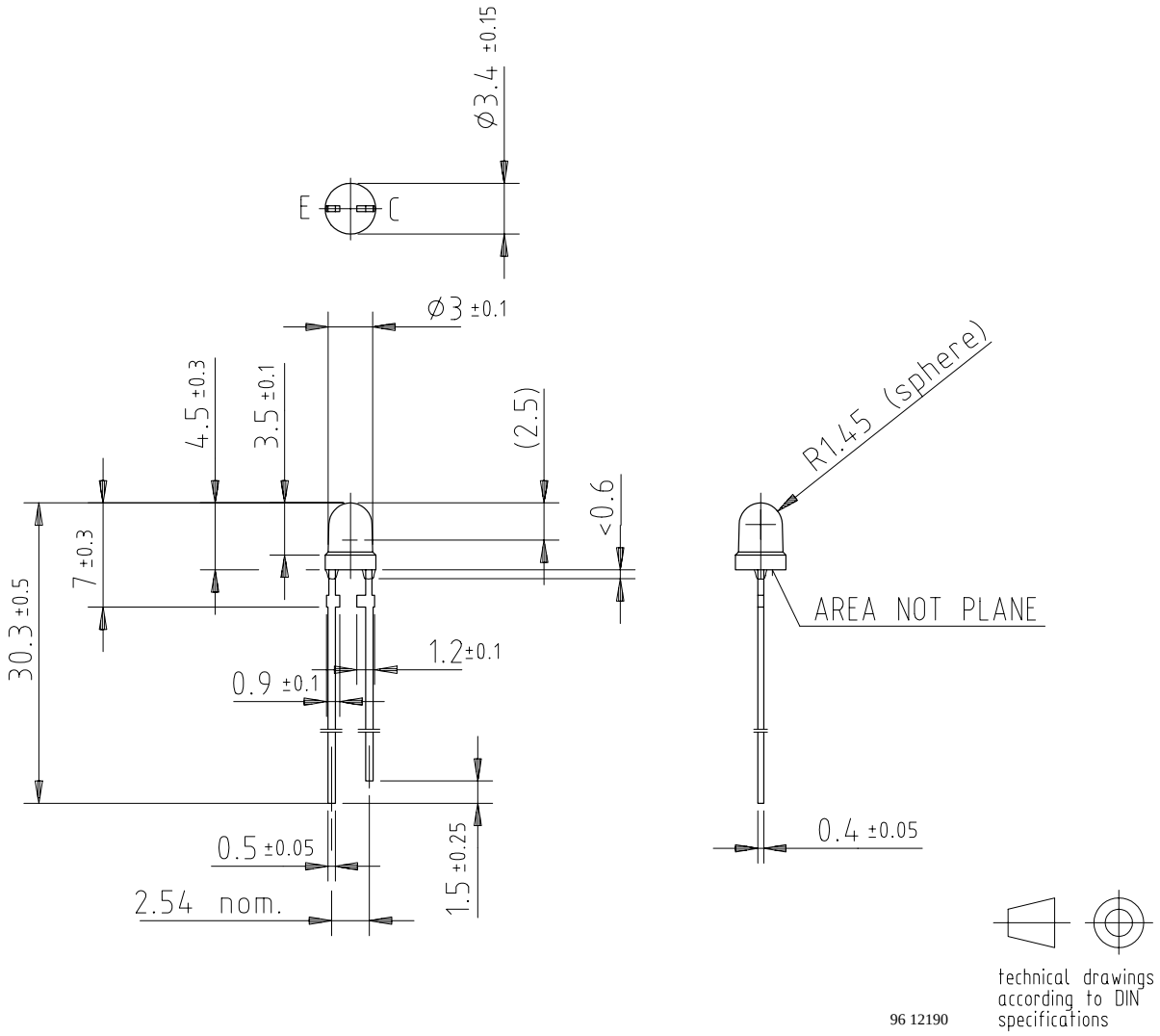


Figure 7. Relative Radiant Sensitivity vs. Angular Displacement

Dimensions in mm



Ozone Depleting Substances Policy Statement

It is the policy of **Vishay Semiconductor GmbH** to

1. Meet all present and future national and international statutory requirements.

2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

Vishay Semiconductor GmbH has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively

2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA

3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

Vishay Semiconductor GmbH can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

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