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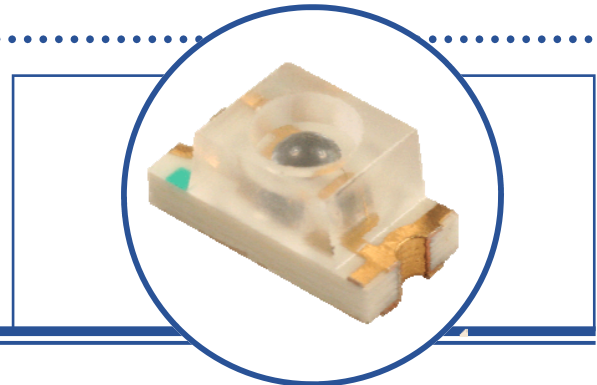
[sales@integrated-circuit.com](mailto:sales@integrated-circuit.com)

# Silicon Phototransistor in Miniature SMT Package



## OP522

- High Photo Sensitivity
- Fast Response Time
- 1206 Package Size with Internal Lens

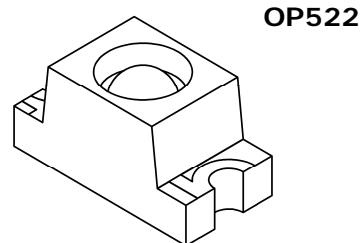
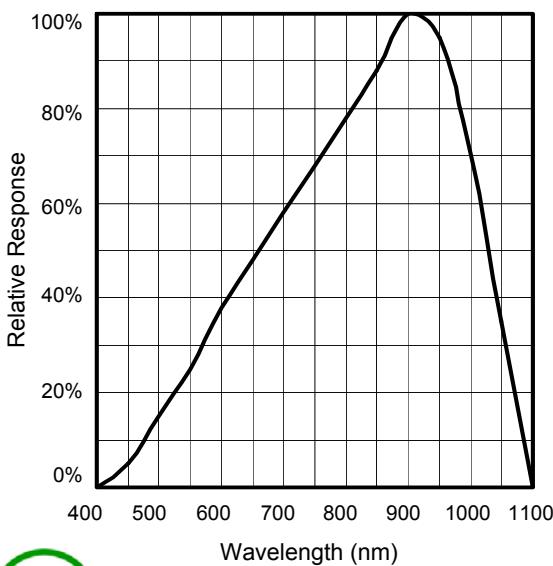


The OP522 is an NPN silicon phototransistor mounted in a miniature SMT package. The device incorporates an integral molded lens which enables a narrow acceptance angle and higher collector currents than devices without lenses. This device is packaged in a 1206 size chip carrier that is compatible with most automated mounting equipment. The OP522 is mechanically and spectrally matched to the OP250 series infrared LEDs.

## Applications

- Non-Contact Position Sensing
- Datum detection
- Machine automation
- Optical encoders

Relative Response vs. Wavelength



**RoHS**

OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.

# SMT Silicon Phototransistor

## OP522



### Absolute Maximum Ratings

$T_A = 25^\circ\text{C}$  unless otherwise noted

Storage Temperature Range	-40° C to +85° C
Operating Temperature Range	-25° C to +85° C
Lead Soldering Temperature	260° C <sup>(1)</sup>
Collector-Emitter Voltage	30 V
Emitter-Collector Voltage	5 V
Collector Current	20 mA
Power Dissipation	75 mW <sup>(2)</sup>

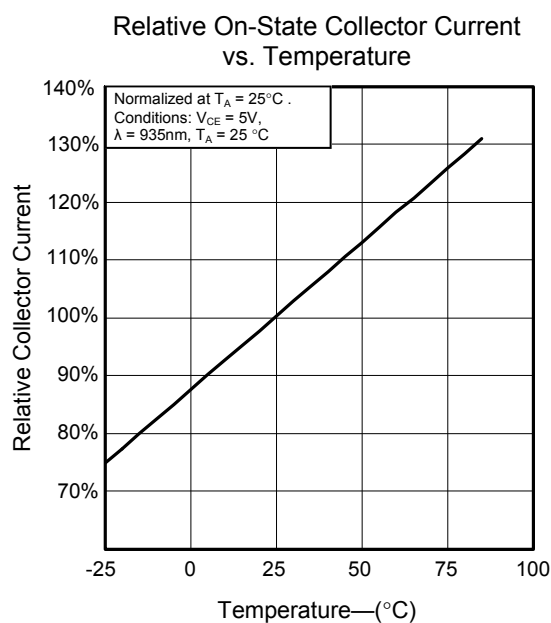
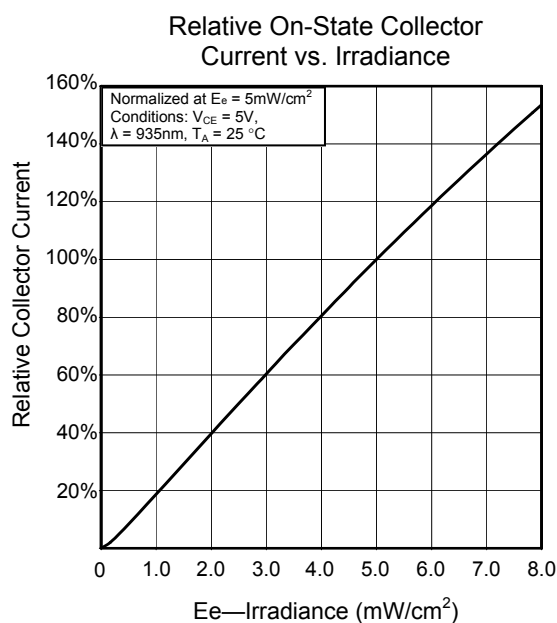
Notes:

- Solder time less than 5 seconds at temperature extreme.
- De-rate linearly at 2.17 mW/° C above 25° C.

### Electrical Characteristics ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	CONDITIONS
$I_{C(ON)}$	On-State Collector Current	0.5			mA	$V_{CE} = 5.0\text{V}$ , $E_e = 5.0\text{mW/cm}^2$ <sup>(3)</sup>
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage			0.4	V	$I_C = 100\mu\text{A}$ , $E_e = 2.0\text{mW/cm}^2$ <sup>(3)</sup>
$I_{CEO}$	Collector-Emitter Dark Current			100	nA	$V_{CE} = 5.0\text{V}$ , $E_e = 0$ <sup>(4)</sup>
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	30			V	$I_C = 100\mu\text{A}$
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	5			V	$I_E = 100\mu\text{A}$
$t_r$ , $t_f$	Rise and Fall Times		15		$\mu\text{s}$	$I_C = 1\text{mA}$ , $R_L = 1\text{K}\Omega$

- Light source is an unfiltered GaAs LED with a peak emission wavelength of 935nm and a radiometric intensity level which varies less than 10% over the entire lens surface of the phototransistor being tested.
- To Calculate typical collector dark current in  $\mu\text{A}$ , use the formula  $I_{CEO} = 10^{(0.04 T_A - 3/4)}$  where  $T_A$  is the ambient temperature in ° C.



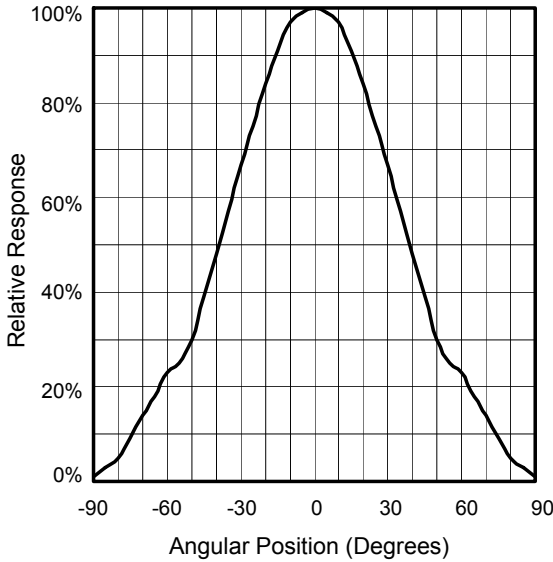
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# SMT Silicon Phototransistor

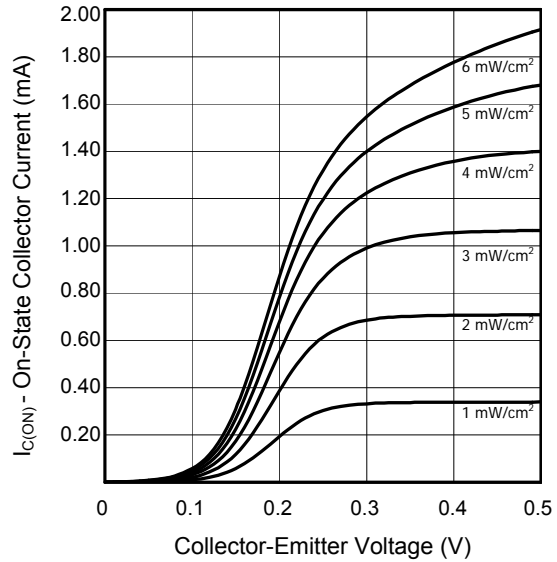
## OP522



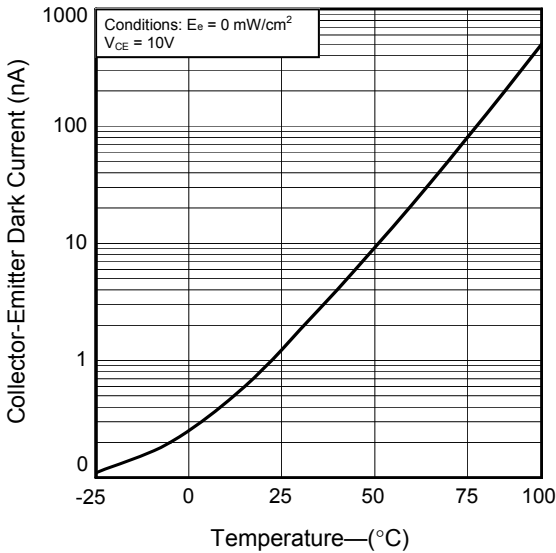
Relative Response vs. Angular Position



Relative On-State Collector Current vs. Collector-Emitter Voltage



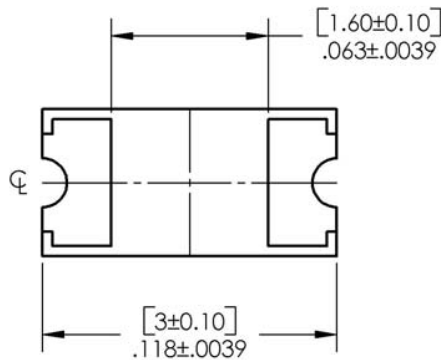
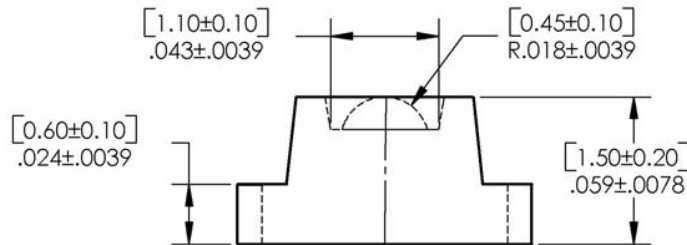
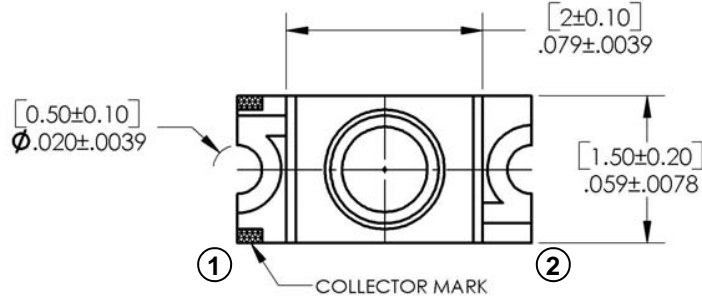
Collector-Emitter Dark Current vs. Temperature



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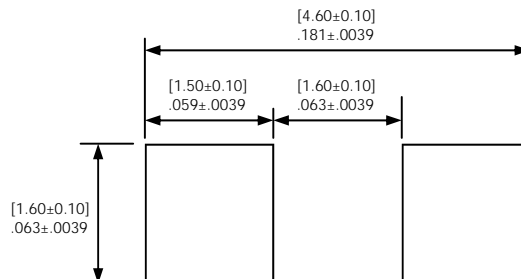
# SMT Silicon Phototransistor

## OP522



DIMENSIONS ARE IN INCHES AND [MILLIMETERS].

RECOMMENDED SOLDER PADS



PIN	FUNCTION
1	Collector
2	Emitter

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