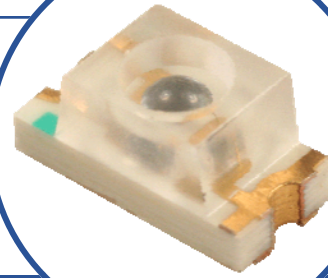


# Silicon Phototransistor in Miniature SMT Package

## OP522

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

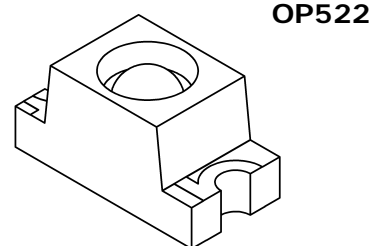
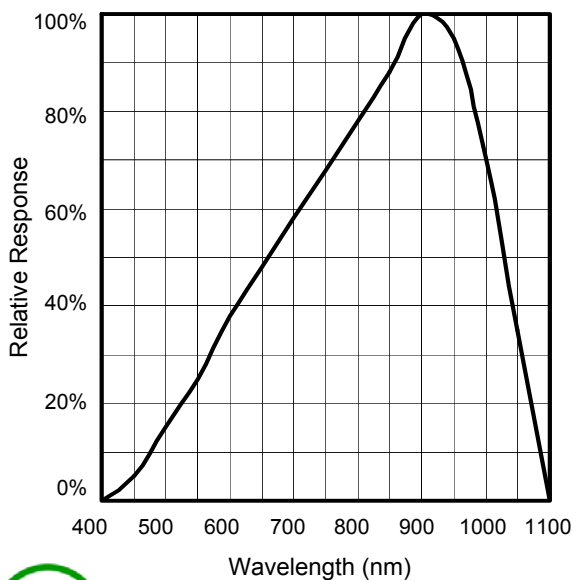


The OP522 is an NPN silicon phototransistor mounted in a miniature SMT package. The device incorporates an integral molded lens which enables a narrow acceptance angle and higher collector currents than devices without lenses. This device is packaged in a 1206 size chip carrier that is compatible with 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.

### 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>  |

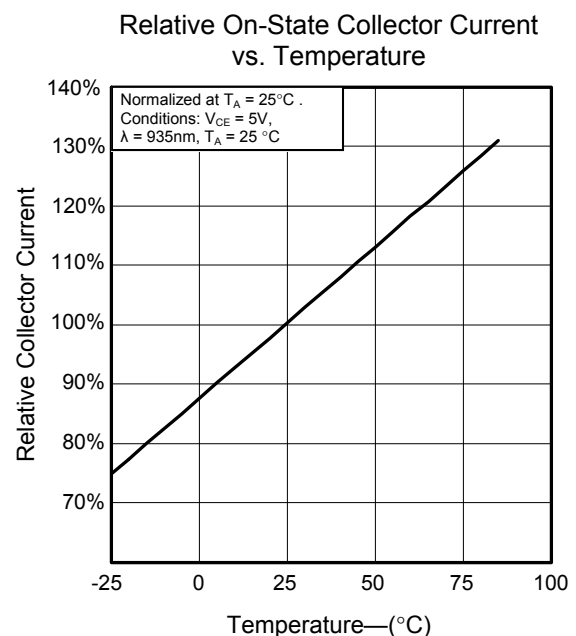
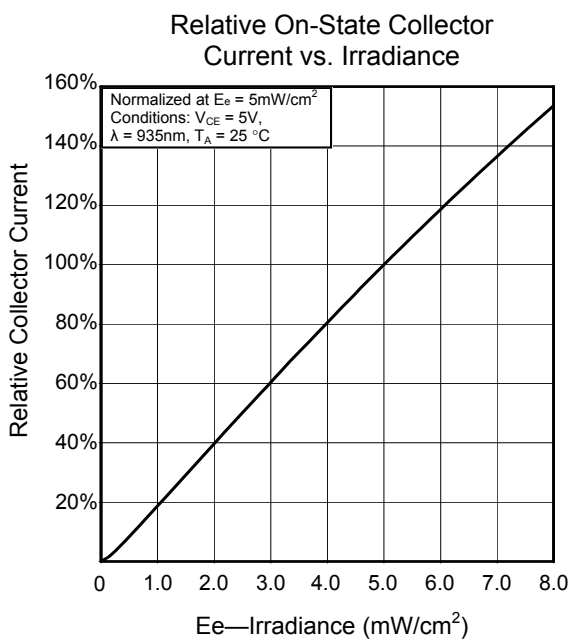
Notes:

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

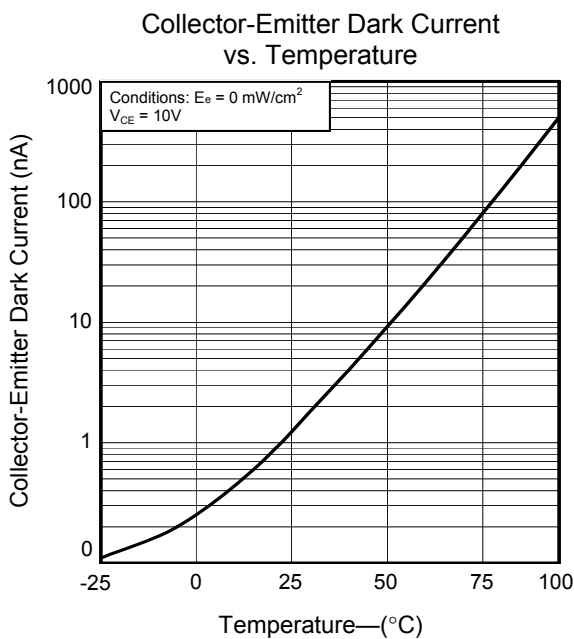
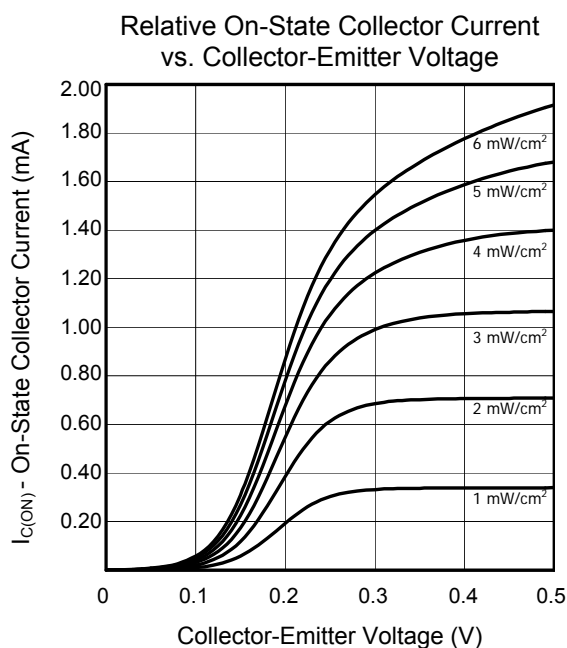
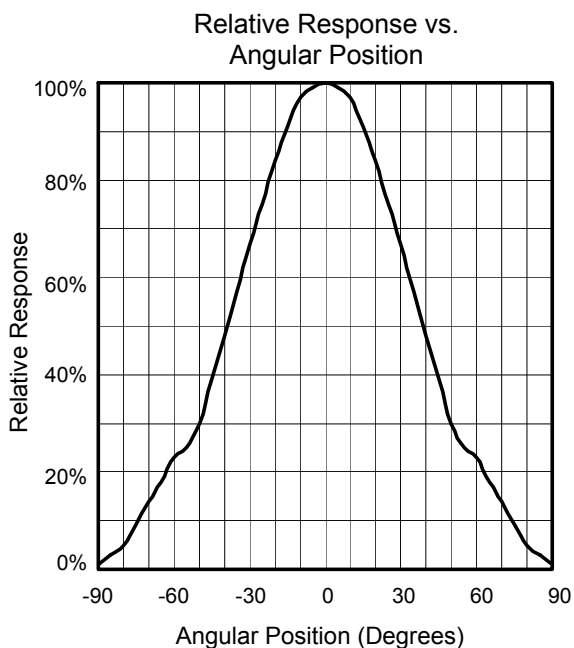
### Electrical Characteristics ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

| SYMBOL        | PARAMETER                            | MIN | TYP | MAX | UNITS         | CONDITIONS   |
|---------------|--------------------------------------|-----|-----|-----|---------------|--|
| $I_{C(ON)}$   | On-State Collector Current           | 0.5 |     |     | mA            | $V_{CE} = 5.0\text{V}$ , $E_e = 5.0\text{mW}/\text{cm}^2$ <sup>(3)</sup> |
| $V_{CE(SAT)}$ | Collector-Emitter Saturation Voltage |     |     | 0.4 | V             | $I_C = 100\mu\text{A}$ , $E_e = 2.0\text{mW}/\text{cm}^2$ <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.



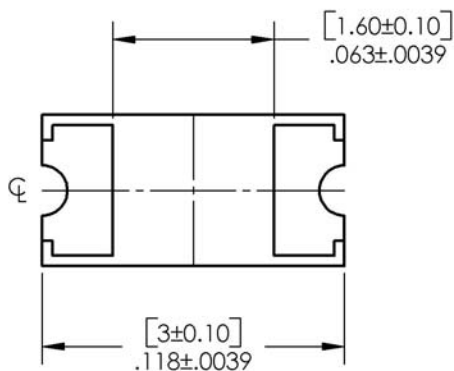
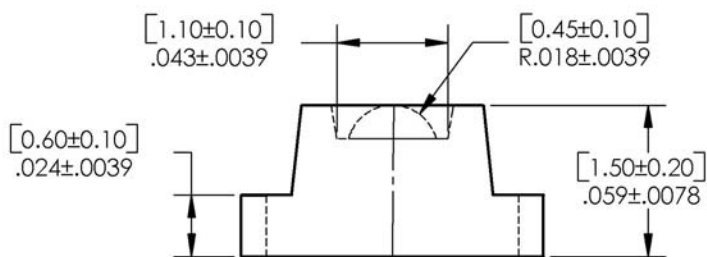
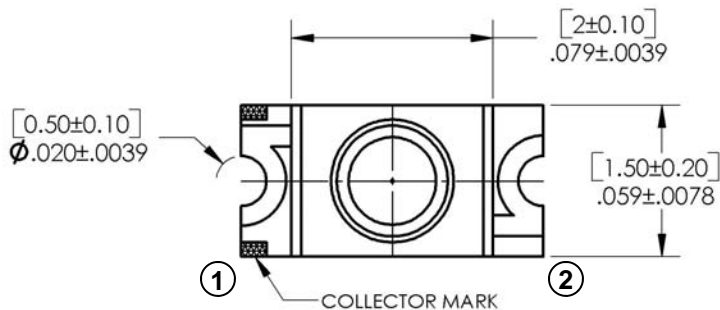
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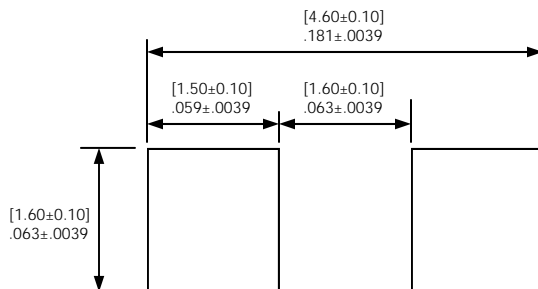
# SMT Silicon Phototransistor

## OP522



DIMENSIONS ARE IN INCHES AND [MILLIMETERS].

### RECOMMENDED SOLDER PADS



| PIN | FUNCTION  |
|-----|-----------|
| 1   | Collector |
| 2   | Emitter   |

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