

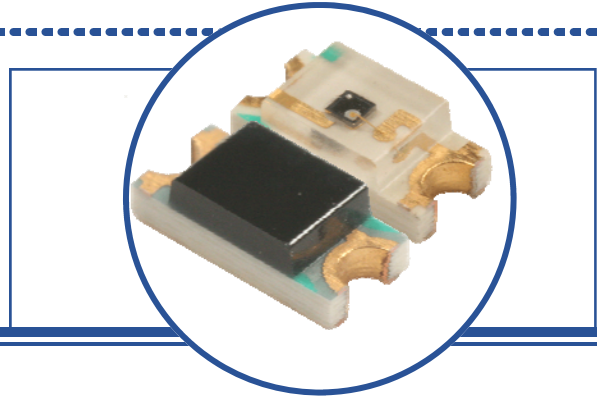
# SMD Silicon Phototransistor

## OP520, OP521



### OP520, OP521

- High Photo Sensitivity
- Fast Response Time
- 1206 Package Size
- Opaque or Water Clear Flat Lens

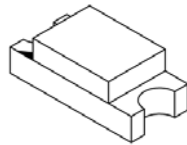


#### Description:

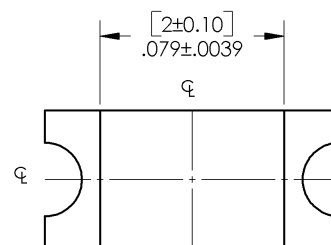
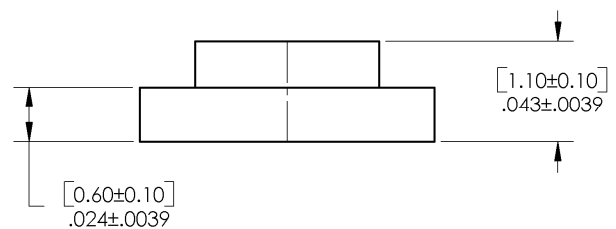
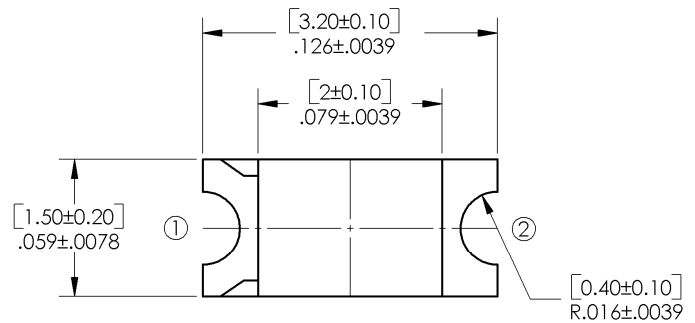
The OP520 and OP521 are NPN silicon phototransistor mounted in miniature SMT packages. Both the OP520 and OP521 have a flat lens however, the OP520 lens is opaque to shield the device from stray light. These sensors are packaged in 1206 size chip carriers that are compatible with most automated mounting equipment. The OP520 and OP521 are mechanically and spectrally matched to the OP250 series infrared LEDs.

#### Applications

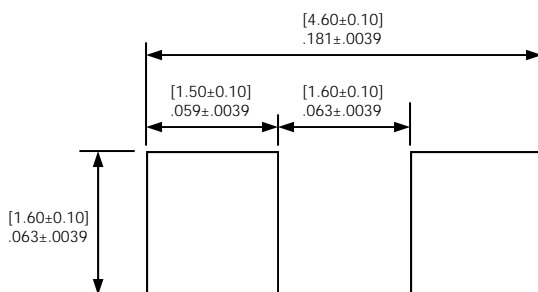
- Non-Contact Position Sensing
- Datum detection
- Machine automation
- Optical encoders



PIN	FUNCTION
1	Collector
2	Emitter



#### RECOMMENDED SOLDER PADS



RoHS

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

DIMENSIONS ARE IN INCHES AND [MILLIMETERS].

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## OP520, OP521



### 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>

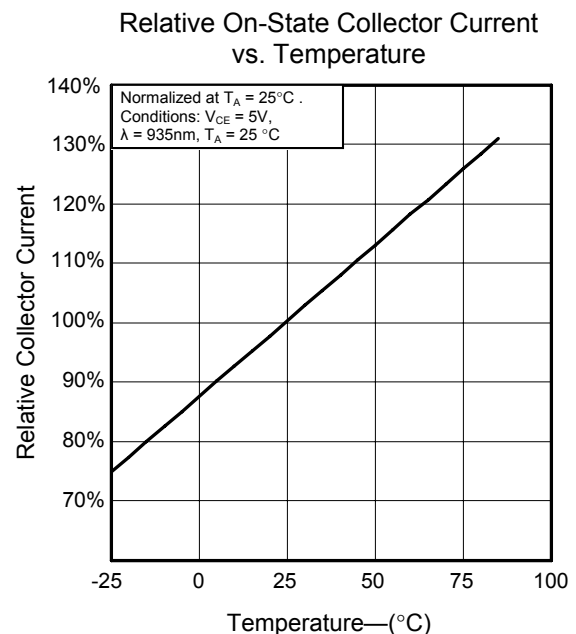
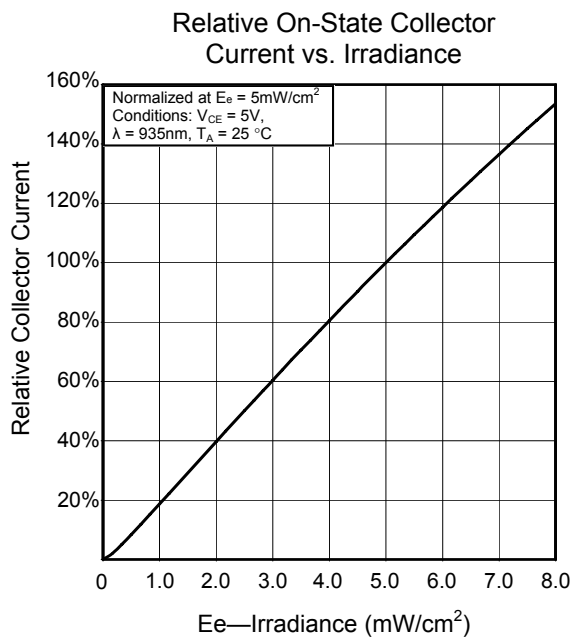
Notes:

- 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	0.25			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	$I_C = 100\mu\text{A}$ , $E_e = 5.0\text{mW/cm}^2$ <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	$I_C = 100\mu\text{A}$ , $E_e = 0$
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	5			V	$I_E = 100\mu\text{A}$ , $E_e = 0$
$t_r$ , $t_f$	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  $I_{CEO} = 10^{(0.04T_A - 3.4)}$  where  $T_A$  is the ambient temperature in ° C.



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