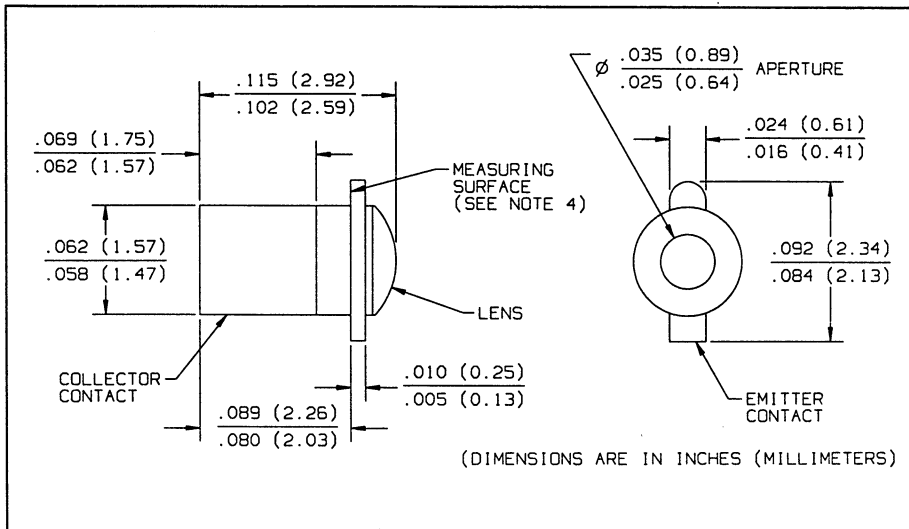
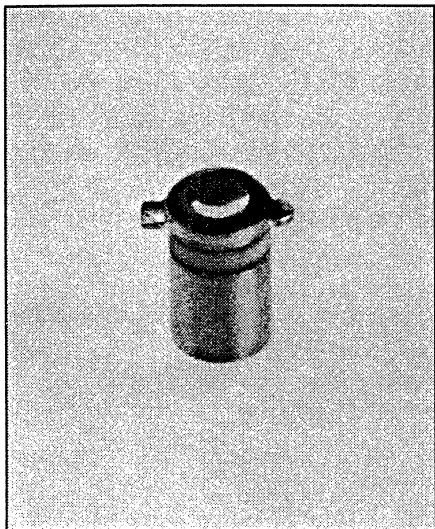


# NPN Silicon Phototransistors Types OP641SL, OP642SL, OP643SL, OP644SL



## Features

- Narrow receiving angle
- Variety of sensitivity ranges
- Enhanced temperature range
- Ideal for direct mounting in PC boards
- Mechanically and spectrally matched to the OP123 and OP223 series LED's

## Description

The OP641SL series devices consist of NPN silicon phototransistors mounted in hermetically sealed packages. The narrow receiving angle provides excellent on-axis coupling.

## Replaces

OP600, OP640 series

## Absolute Maximum Ratings ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

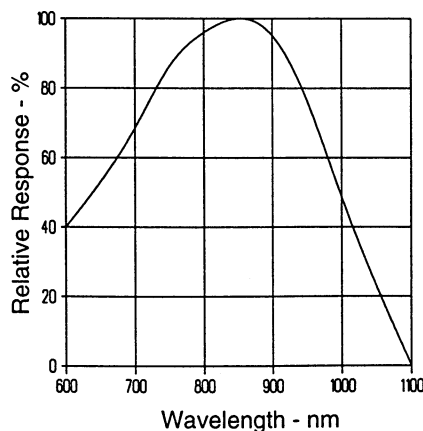
|                                                    |                                             |
|----------------------------------------------------|---------------------------------------------|
| Collector-Emitter Voltage                          | 25 V                                        |
| Emitter-Collector Voltage                          | 5.0 V                                       |
| Storage Temperature Range                          | $-65^\circ\text{C}$ to $+150^\circ\text{C}$ |
| Operating Temperature Range                        | $-65^\circ\text{C}$ to $+125^\circ\text{C}$ |
| Soldering Temperature (5 sec. with soldering iron) | $260^\circ\text{C}^{(1)(2)}$                |
| Power Dissipation                                  | 50 mW <sup>(3)</sup>                        |
| Continuous Collector Current                       | 50 mA                                       |

### Notes:

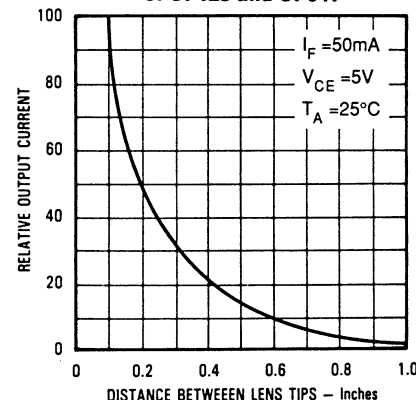
- (1) Refer to Application Bulletin 202 which discusses proper techniques for soldering Pill type devices to PC boards.
- (2) No clean or low solids, RMA flux is recommended. Duration can be extended to 10 sec. max. when flow soldering.
- (3) Derate linearly 0.5 mW/ $^\circ\text{C}$  above  $25^\circ\text{C}$ .
- (4) Junction temperature maintained at  $25^\circ\text{C}$ .
- (5) Light source is an unfiltered tungsten bulb operating at  $CT = 2870\text{ K}$  or equivalent infrared source.

## Typical Performance Curves

Typical Spectral Response



Coupling Characteristics of OP123 and OP641



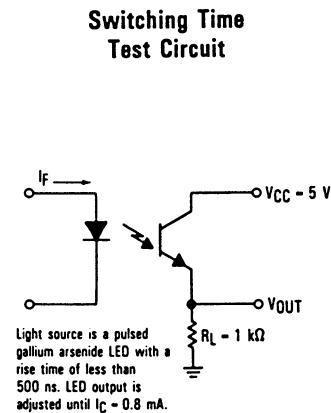
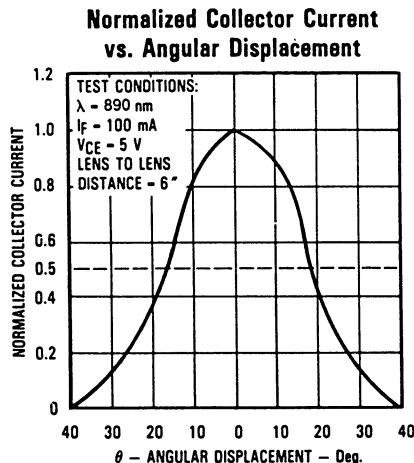
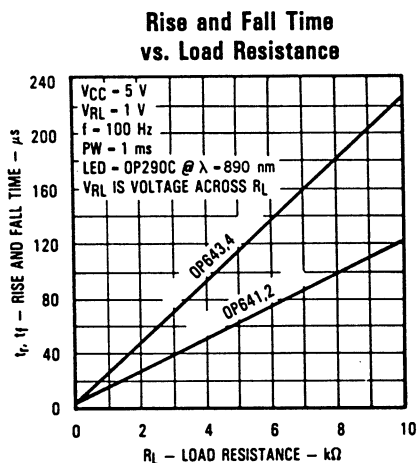
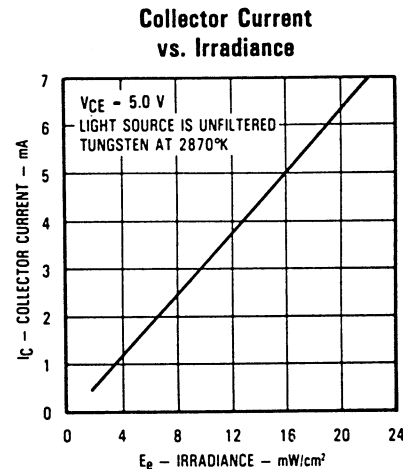
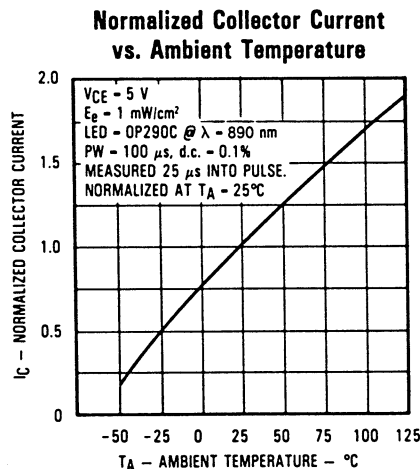
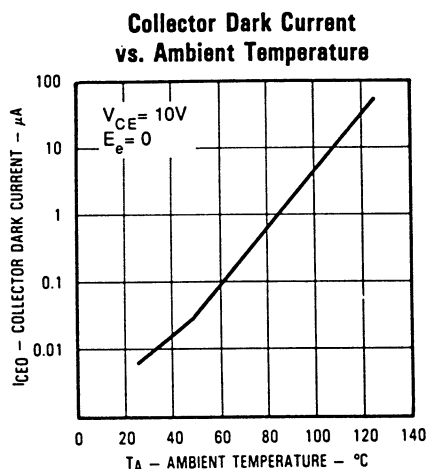
# Types OP641SL, OP642SL, OP643SL, OP644SL

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

| SYMBOL              | PARAMETER                            | MIN                                      | TYP                      | MAX                       | UNITS         | TEST CONDITIONS                                                                                 |
|---------------------|--------------------------------------|------------------------------------------|--------------------------|---------------------------|---------------|-------------------------------------------------------------------------------------------------|
| $I_{C(ON)}^{(4)}$   | On-State Collector Current           | OP641SL<br>OP642SL<br>OP643SL<br>OP644SL | 0.5<br>2.0<br>4.0<br>7.0 | 3.0<br>5.0<br>8.0<br>22.0 | mA            | $V_{CE} = 5\text{ V}$ , $E_e = 20\text{ mW/cm}^2^{(5)}$                                         |
| $I_{CEO}$           | Collector Dark Current               |                                          |                          | 100                       | nA            | $V_{CE} = 10\text{ V}$ , $E_e = 0$                                                              |
| $V_{(BR)CEO}$       | Collector-Emitter Breakdown Voltage  | 25                                       |                          |                           | V             | $I_C = 100\text{ }\mu\text{A}$                                                                  |
| $V_{(BR)ECO}$       | Emitter-Collector Breakdown Voltage  | 5.0                                      |                          |                           | V             | $I_E = 100\text{ }\mu\text{A}$                                                                  |
| $V_{CE(SAT)}^{(4)}$ | Collector-Emitter Saturation Voltage |                                          |                          | 0.40                      | V             | $I_C = 0.4\text{ mA}$ , $E_e = 20\text{ mW/cm}^2^{(5)}$                                         |
| $t_r$               | Rise Time                            |                                          | 15                       |                           | $\mu\text{s}$ | $V_{CC} = 5\text{ V}$ , $I_C = 0.80\text{ mA}$ ,<br>$R_L = 1\text{ k}\Omega$ , See Test Circuit |
| $t_f$               | Fall Time                            |                                          | 15                       |                           | $\mu\text{s}$ |                                                                                                 |

PHOTOSENSORS

## Typical Performance Curves



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

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