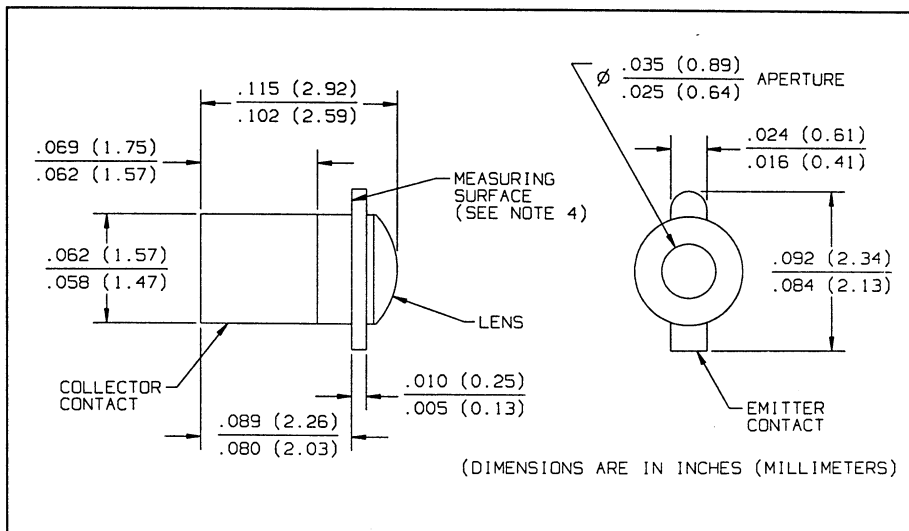
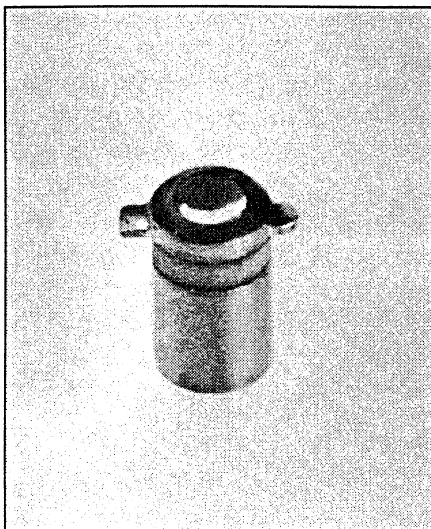


NPN Silicon Photodarlington

Types OP300SL, OP301SL, OP302SL, OP303SL, OP304SL, OP305SL



Features

- Narrow receiving angle
- Variety of sensitivity ranges
- Enhanced temperature range
- High current gain
- Ideal for direct mounting in PC boards
- Mechanically and spectrally matched to the OP123 and OP223 series emitters

Description

The OP300SL through OP305SL series devices consist of NPN silicon photodarlington mounted in hermetically sealed "Pill" type packages. The narrow receiving angle provides excellent on-axis coupling. Photodarlington are normally used in applications where light signal levels are low and more current gain is needed than is possible with phototransistors.

Replaces

OP300 series

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

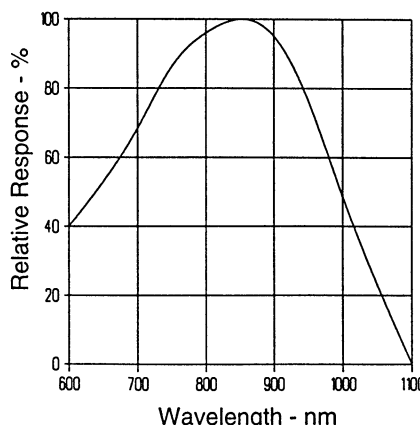
| | |
|--|---|
| Collector-Emitter Voltage | 15.0 V |
| Emitter-Collector Voltage | 5.0 V |
| Storage Temperature Range | -65°C to $+150^\circ\text{C}$ |
| Operating Temperature Range | -65°C to $+125^\circ\text{C}$ |
| Soldering Temperature (5 sec. with soldering iron) | $260^\circ\text{C}^{(1)(2)}$ |
| Power Dissipation | 50 mW ⁽³⁾ |
| Continuous Collector Current | 50 mA |

Notes:

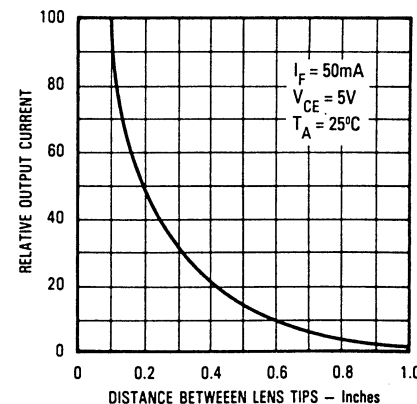
- (1) Refer to Application Bulletin 202 which discusses proper techniques for soldering Pill type devices to PC boards.
- (2) No clean or low solids, RMA flux is recommended. Duration can be extended to 10 sec. max. when flow soldering.
- (3) Derate linearly 0.5 mW/ $^\circ\text{C}$ above 25°C .
- (4) Junction temperature maintained at 25°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 OP300



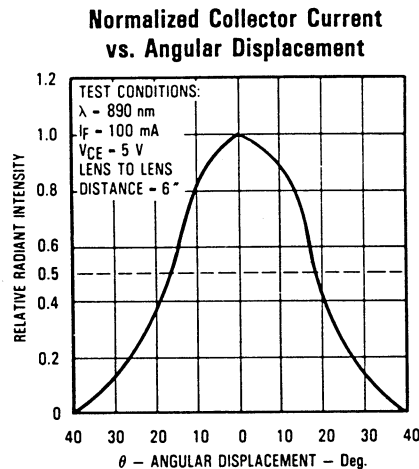
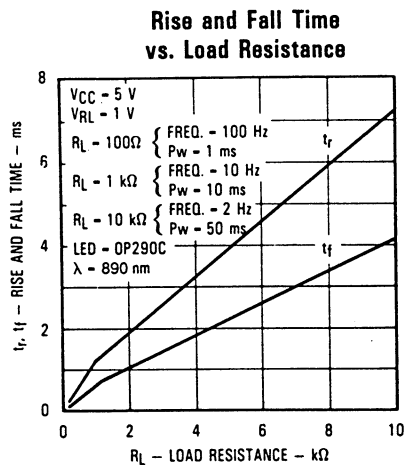
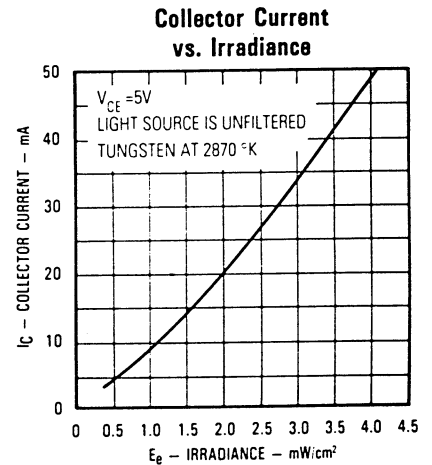
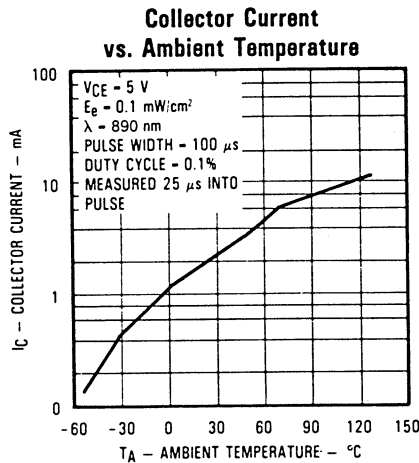
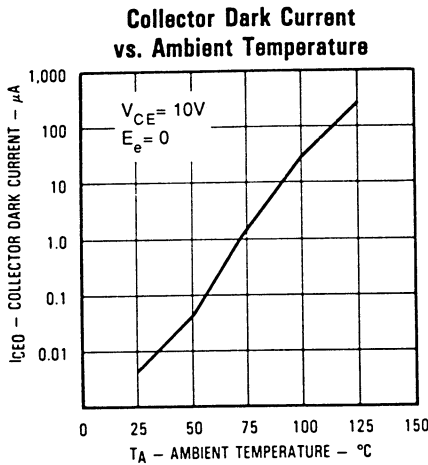
Types OP300SL Thru OP305SL

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 | OP300SL | 0.8 | | | mA $V_{CE} = 5.0\text{ V}$, $E_e = 1.00\text{ mW/cm}^2^{(5)}$ |
| | | OP301SL | 0.8 | | 2.4 | |
| | | OP302SL | 1.8 | | 5.4 | |
| | | OP303SL | 3.6 | | 12.0 | |
| | | OP304SL | 7.0 | | 21.0 | |
| | | OP305SL | 14.0 | | | |
| I_{CE0} | Collector Dark Current | | | 1.00 | μA | $V_{CE} = 10\text{ V}$, $E_e = 0$ |
| $V_{(BR)CEO}$ | Collector-Emmitter Breakdown Voltage | 15.0 | | | V | $I_C = 100\ \mu\text{A}$ |
| $V_{(BR)ECO}$ | Emmitter-Collector Breakdown Voltage | 5.0 | | | V | $I_E = 100\ \mu\text{A}$ |
| $V_{CE(SAT)}^{(4)}$ | Collector-Emmitter Saturation Voltage | OP300SL, OP301SL | | 1.10 | V | $I_C = 0.4\text{ mA}$, $E_e = 1.0\text{ mW/cm}^2^{(5)}$ |
| | | OP302SL thru OP305SL | | 1.10 | V | $I_C = 1.0\text{ mA}$, $E_e = 1.0\text{ mW/cm}^2^{(5)}$ |

PHOTOSENSORS

Typical Performance Curves



Switching Time Test Circuit

