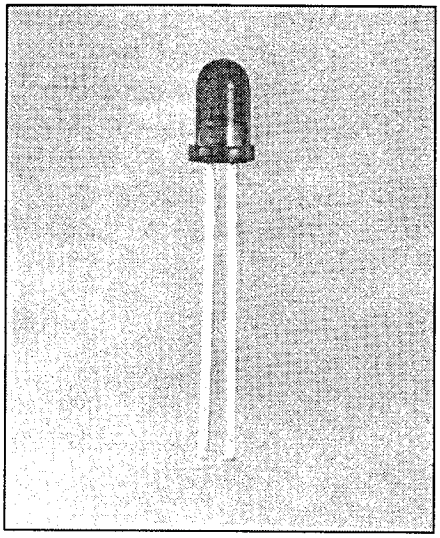
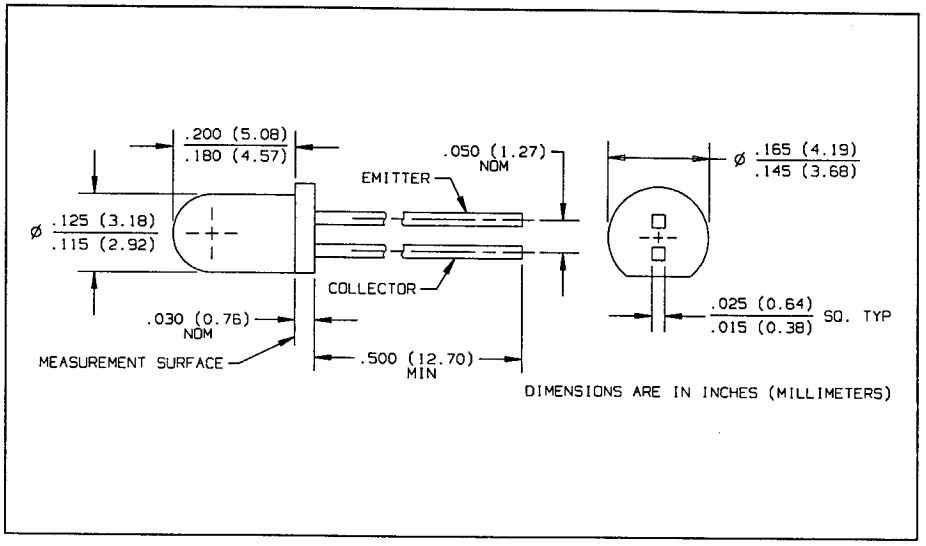
# NPN Silicon Photodarlington
# Type OP535A, OP535B, OP535C






## Features

- Narrow receiving angle
- T-1 package style
- High current gain
- Small package size for space limited applications

## Description

The OP535 consists of an NPN silicon photodarlington molded in a green plastic package. The narrow receiving angle provides excellent on-axis coupling. These devices are 100% production tested using infrared light for close correlation with Optek GaAs and GaAlAs emitters. Photodarlington devices are normally used in applications where light signal levels are low and more current gain is needed than is possible with phototransistors.

## Replaces

OP530 and K9000

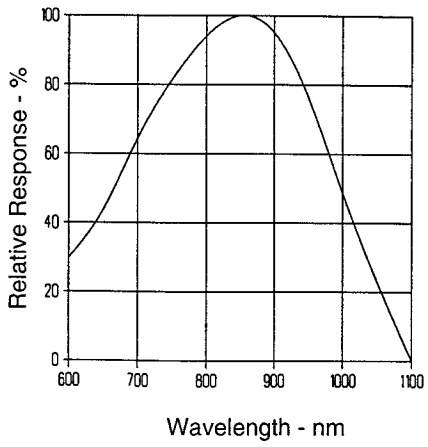
## Absolute Maximum Ratings ($T_A$ = 25° C unless otherwise noted)

| | |
|---|---|
| Collector-Emitter Voltage | 15.0 V |
| Emitter-Collector Voltage | 5.0 V |
| Storage and Operating Temperature Range | -40° C to +100° C |
| Lead Soldering Temperature [1/16 inch (1.6 mm) from case for 5 sec. with soldering iron] | 260° C(1) |
| Power Dissipation | 100 mW(2) |

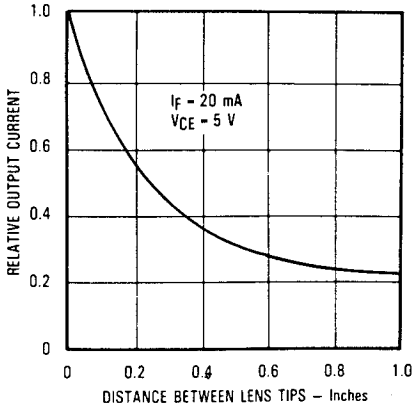
**Notes:**
(1) RMA flux is recommended. Duration can be extended to 10 sec. max. when flow soldering. Max. 20 grams force may be applied to leads when soldering.
(2) Derate linearly 1.33 mW/° C above 25° C.
(3) Light source is an unfiltered GaAs LED with a peak emission wavelength of 935 nm and a radiometric intensity level which varies less than 10% over the entire lens surface of the phototransistor being tested.

## Typical Performance Curves

**Typical Spectral Response**




**Coupling Characteristics of OP165 and OP535**



# Types OP535A, OP535B, OP535C

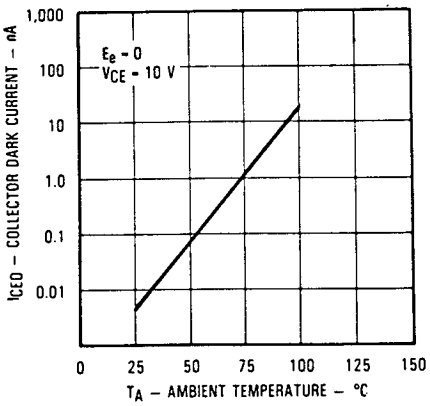
**Electrical Characteristics** ($T_A$ = 25° C unless otherwise noted)

| SYMBOL | PARAMETER | | MIN | TYP | MAX | UNITS | TEST CONDITIONS |
|---|---|---|---|---|---|---|---|
| $I_{C(ON)}$[3] | On-State Collector Current | OP535C<br>OP535B<br>OP535A | 1.5<br>3.5<br>10.5 | - | 32.0 | mA | $V_{CE}$ = 5.0 V,<br>$E_e$ = 0.13 mW/cm$^2$ |
| $I_{CEO}$ | Collector Dark Current | | | | 100 | nA | $V_{CE}$ = 10.0 V, $E_e$ = 0 |
| $V_{(BR)CEO}$ | Collector-Emitter Breakdown Voltage | | 15.0 | | | V | $I_C$ = 1.0 mA, $E_e$ = 0 |
| $V_{(BR)ECO}$ | Emitter-Collector Breakdown Voltage | | 5.0 | | | V | $I_E$ = 100 µA, $E_e$ = 0 |
| $V_{CE(SAT)}$[3] | Collector-Emitter Saturation Voltage | | | | 1.10 | V | $I_C$ = 0.4 mA, $E_e$ = 0.13 mW/cm$^2$ |

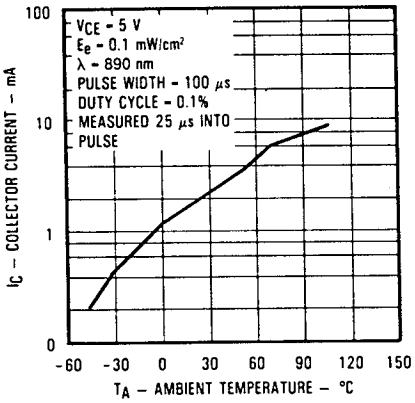
PHOTOSENSORS

## Typical Performance Curves

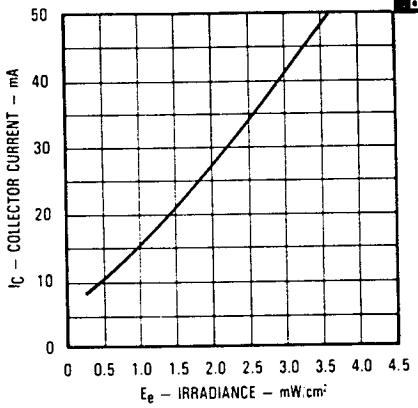
**Collector Dark Current vs. Ambient Temperature**



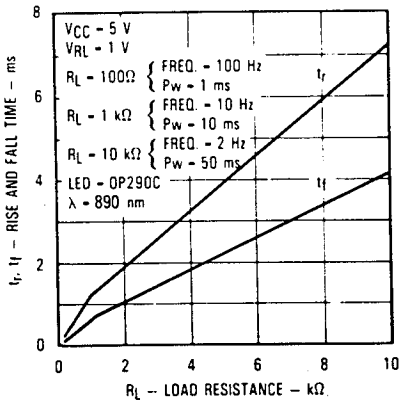

**Collector Current vs. Ambient Temperature**



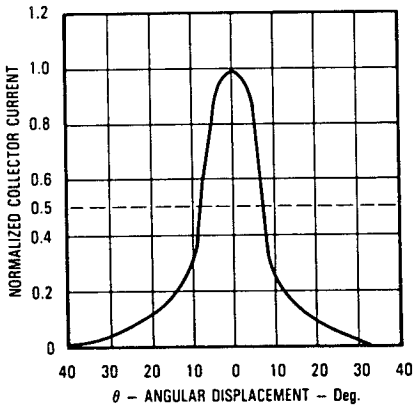

**Collector Current vs. Irradiance**




**Rise and Fall Time vs. Load Resistance**




**Normalized Collector Current vs. Angular Displacement**




**Switching Time Test Circuit**

