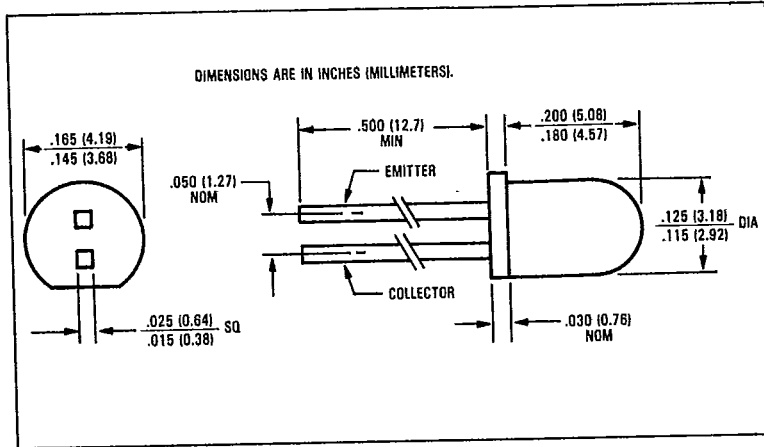
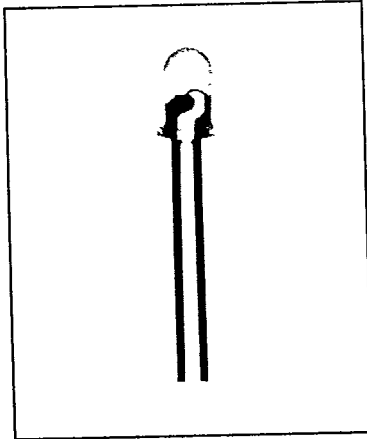


Product Bulletin OP535  
July 1989 Replaces January 1985

# NPN Silicon Photodarlington Type OP535

T-41-63



## 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 epoxy 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 (TA = 25°C unless otherwise noted)

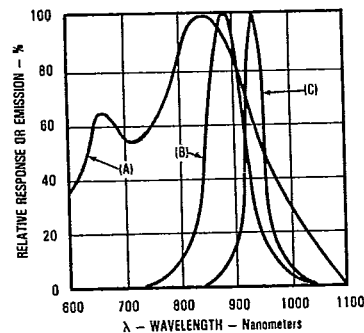
|                                                                                         |                      |
|-----------------------------------------------------------------------------------------|----------------------|
| Collector-Emitter Voltage                                           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

### 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 flow 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 930nm and a radiometric intensity level which varies less than 10% over the entire lens surface of the phototransistor being tested.

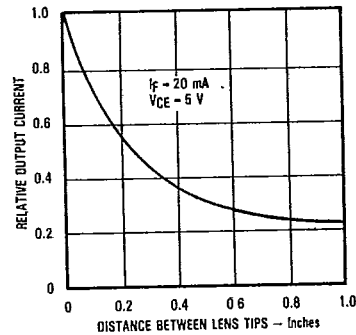
## Typical Performance Curves

Spectral Response of OP535  
vs. GaAlAs and GaAs



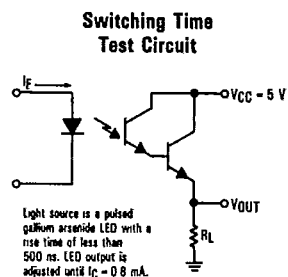
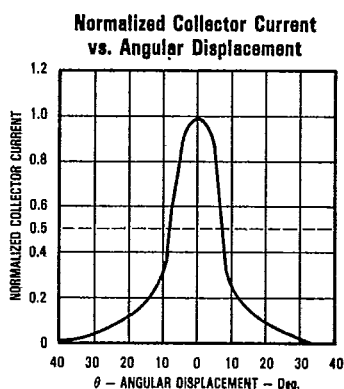
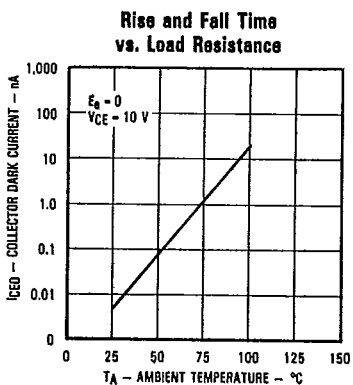
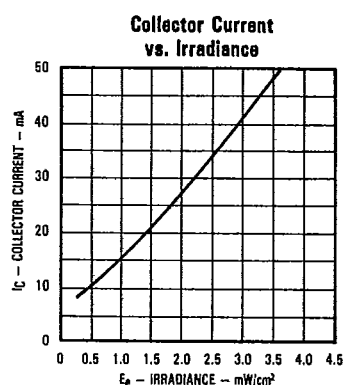
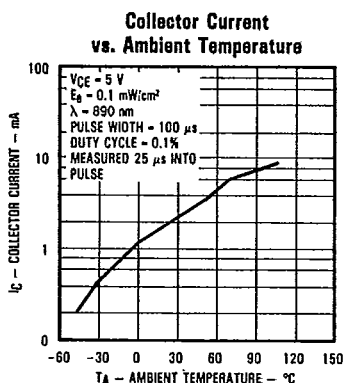
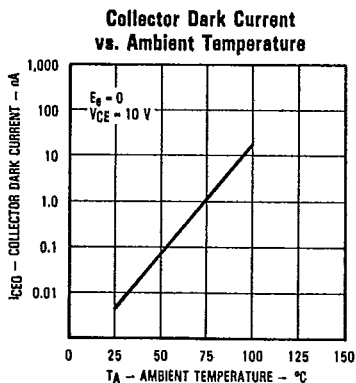
Test Conditions (LED): TA = TJ = 25°C, IF = 100 mA,  
DC - 0.1%, PW = 100 μs  
Peak Wavelength - λp: (A) XSTR - 850 ± 30 nm, (B) LED  
GaAlAs - 890 ± 20 nm, (C) LED GaAs - 930 ± 15 nm

Coupling Characteristics  
of OP165 and OP535



| SYMBOL              | PARAMETER                            | MIN  | TYP | MAX  | UNITS | TEST CONDITIONS                                    |
|---------------------|--------------------------------------|------|-----|------|-------|----------------------------------------------------|
| $I_{C(ON)}^{(3)}$   | On-State Collector Current           | 1.0  |     |      | mA    | $V_{CE}=5.0\text{V}$ , $E_0=0.130\text{mW/cm}^2$   |
| $I_{CEO}$           | Collector Dark Current               |      |     | 100  | nA    | $V_{CE} = 10.0\text{V}$ , $E_0 = 0$                |
| $V_{(BR)CEO}$       | Collector-Emitter Breakdown Voltage  | 15.0 |     |      | V     | $I_C = 1.0\text{mA}$ , $E_0 = 0$                   |
| $V_{(BR)ECO}$       | Emitter-Collector Breakdown Voltage  | 5.0  |     |      | V     | $I_E = 100\mu\text{A}$ , $E_0 = 0$                 |
| $V_{CE(SAT)}^{(3)}$ | Collector-Emitter Saturation Voltage |      |     | 1.10 | V     | $I_C = 0.4\text{mA}$ , $E_0 = 0.130\text{mW/cm}^2$ |

### Typical Performance Curves



PHOTOSENSORS

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

Optek Technology, Inc., 1215 West Crosby Road, Carrollton, Texas 75006 (214) 323-2200 TLX 215849 Fax (214) 323-2396  
Printed in USA