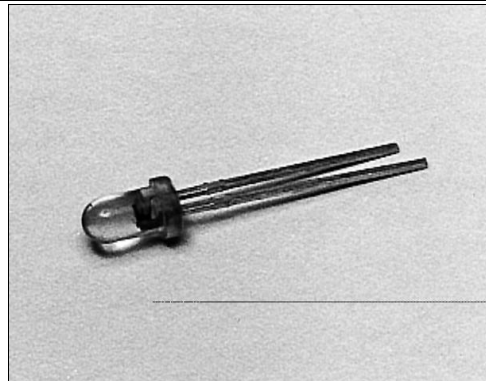


# SDP8405

## Silicon Phototransistor

### FEATURES

- T-1 plastic package
- 20° (nominal) acceptance angle
- Consistent optical properties
- Wide sensitivity ranges
- Mechanically and spectrally matched to SEP8505 and SEP8705 infrared emitting diodes



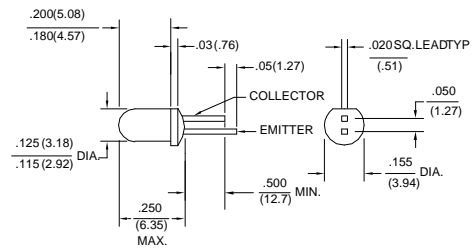
INFRA-22.TIF

### DESCRIPTION

The SDP8405 is an NPN silicon phototransistor transfer molded in a T-1 clear plastic package. Transfer molding of this device assures superior optical centerline performance compared to other molding processes. Lead lengths are staggered to provide a simple method of polarity identification.

### OUTLINE DIMENSIONS in inches (mm)

Tolerance 3 plc decimals ±0.005(0.12)  
2 plc decimals ±0.020(0.51)



DIM\_100.dwg

# SDP8405

## Silicon Phototransistor

### ELECTRICAL CHARACTERISTICS (25°C unless otherwise noted)

| PARAMETER  | SYMBOL        | MIN                                  | TYP | MAX                  | UNITS         | TEST CONDITIONS   |
|--|---------------|--------------------------------------|-----|----------------------|---------------|---|
| Light Current<br>SDP8405-001<br>SDP8405-002<br>SDP8405-003                               | $I_L$         | 1.00<br>7.00<br>12.0                 |     | 14.0<br>24.0         | mA            | $V_{CE}=5\text{ V}$<br>$H=5\text{ mW/cm}^2$ <sup>(1)</sup>          |
| Light Current<br>SDP8405-011<br>SDP8405-012<br>SDP8405-013<br>SDP8405-014<br>SDP8405-015 | $I_L$         | 0.16<br>0.16<br>0.32<br>0.64<br>1.25 |     | 0.46<br>0.92<br>1.85 | mA            | $V_{CE}=5\text{ V}$<br>$H=0.25\text{ mW/cm}^2$ <sup>(2)</sup>       |
| Collector Dark Current   | $I_{CEO}$     |                                      |     | 100                  | nA            | $V_{CE}=15\text{ V}$ , $H=0$  |
| Collector-Emitter Breakdown Voltage  | $V_{(BR)CEO}$ | 30                                   |     |                      | V             | $I_C=100\text{ }\mu\text{A}$  |
| Emitter-Collector Breakdown Voltage  | $V_{(BR)ECO}$ | 5.0                                  |     |                      | V             | $I_E=100\text{ }\mu\text{A}$  |
| Collector-Emitter Saturation Voltage<br>SDP8405-001 to -003<br>SDP8405-011 to -015       | $V_{CE(SAT)}$ |                                      |     | 0.4                  | V             | $I_C=I_L/8$<br>$H=5\text{ mW/cm}^2$<br>$H=0.25\text{ mW/cm}^2$      |
| Angular Response <sup>(3)</sup>  | $\emptyset$   |                                      | 20  |                      | degr.         | $I_F=\text{Constant}$   |
| Rise And Fall Time   | $t_r, t_f$    |                                      | 15  |                      | $\mu\text{s}$ | $V_{CC}=5\text{ V}$ , $I_L=1\text{ mA}$<br>$R_L=1000\text{ }\Omega$ |

#### Notes

1. The radiation source is a tungsten lamp operating at a color temperature of 2870°K.
2. The radiation source is an IRED with a peak wavelength of 935 nm.
3. Angular response is defined as the total included angle between the half sensitivity points.

### ABSOLUTE MAXIMUM RATINGS

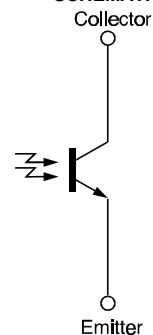
(25°C Free-Air Temperature unless otherwise noted)

|                               |                      |
|-------------------------------|----------------------|
| Collector-Emitter Voltage     | 30 V                 |
| Emitter-Collector Voltage     | 5 V                  |
| Power Dissipation             | 70 mW <sup>(1)</sup> |
| Operating Temperature Range   | -40°C to 85°C        |
| Storage Temperature Range     | -40°C to 85°C        |
| Soldering Temperature (5 sec) | 240°C                |

#### Notes

1. Derate linearly from 25°C free-air temperature at the rate of 0.18 mW/°C.

### SCHEMATIC



Honeywell reserves the right to make changes in order to improve design and supply the best products possible.

# Honeywell

# SDP8405

## Silicon Phototransistor

SWITCHING TIME TEST CIRCUIT

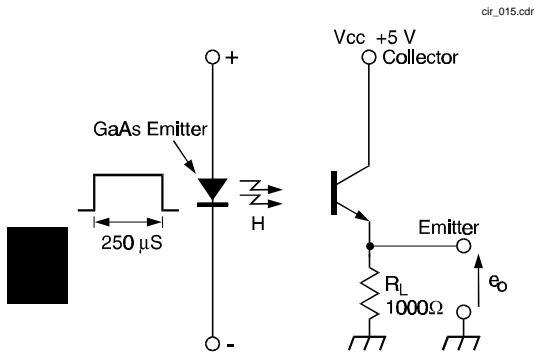


Fig. 1 Responsivity vs Angular Displacement

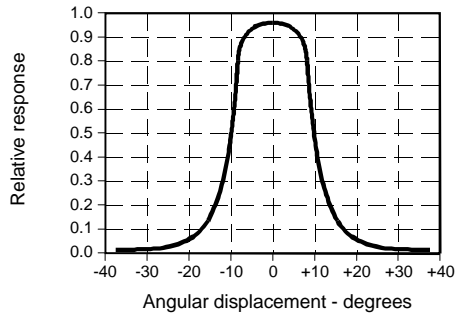
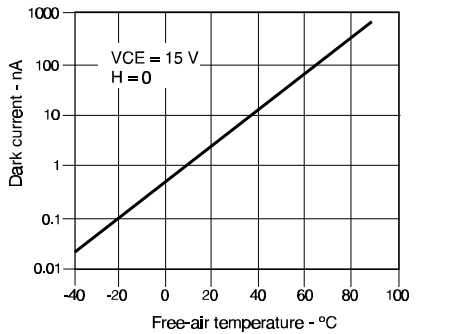


Fig. 3 Dark Current vs Temperature



SWITCHING WAVEFORM

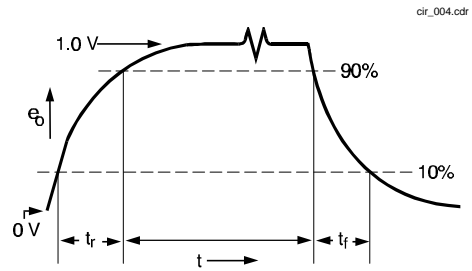


Fig. 2 Collector Current vs Ambient Temperature

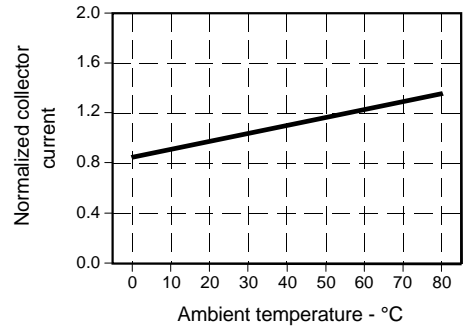
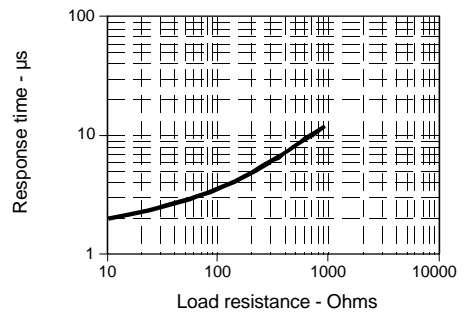


Fig. 4 Non-Saturated Switching Time vs Load Resistance



# SDP8405

## Silicon Phototransistor

Fig. 5 Spectral Responsivity

gra\_036.ds4

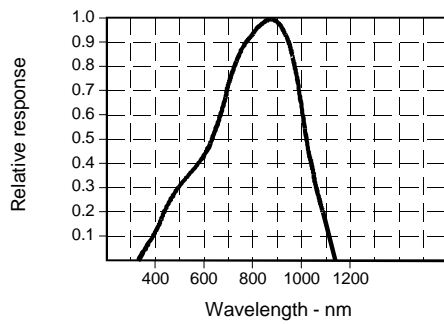
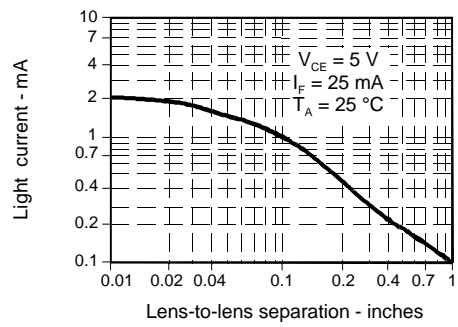


Fig. 6 Coupling Characteristics with SEP8505

gra\_029.ds4



All Performance Curves Show Typical Values