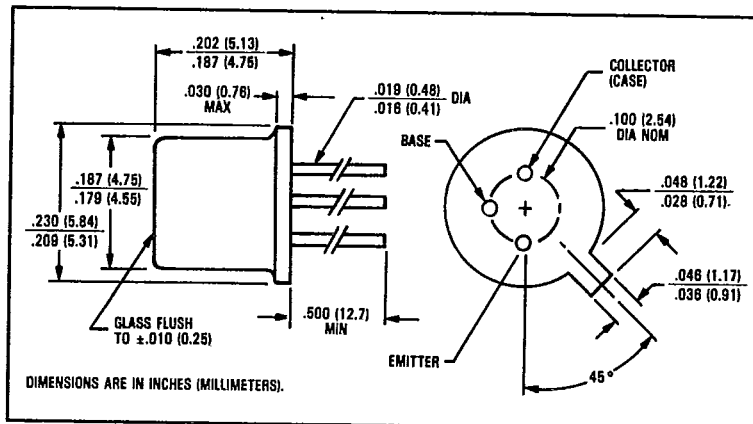
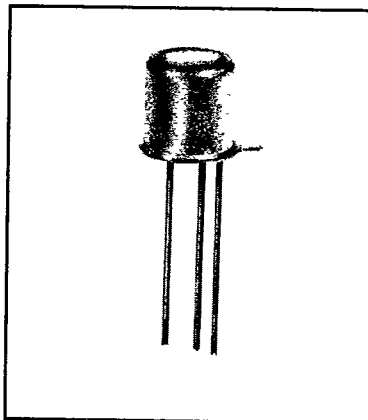


# NPN Silicon Phototransistors Types OP800W, OP801W, OP802W



## Features

- Flat lensed for wide acceptance angle
- Three collector current ranges
- TO-18 hermetically sealed package

## Description

The OP800W, OP801W, and OP802W each consist of an NPN silicon phototransistor mounted in a flat lensed, hermetically sealed TO-18 package. TO-18 packages offer high power dissipation and superior hostile environment operation. The flat lens allows an acceptance half angle of 40° measured from the optical axis to the half power point. The base lead is bonded to enable conventional transistor biasing. This series is mechanically and spectrally matched to the OP130W and OP231W series of infrared emitting diodes.

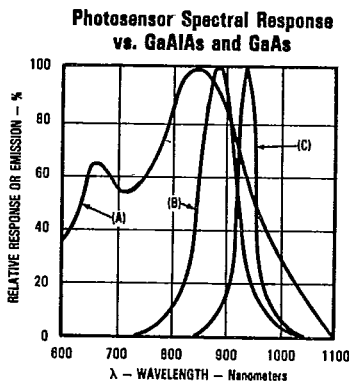
## Absolute Maximum Ratings (T<sub>A</sub> = 25°C unless otherwise noted)

|                                                                                                         |                       |
|---------------------------------------------------------------------------------------------------------|-----------------------|
| Collector-Emitter Voltage                                                                               | 30 V                  |
| Emitter-Collector Voltage                                                                               | 5.0 V                 |
| Storage Temperature Range                                                                               | -65°C to +150°C       |
| Operating Temperature Range                                                                             | -55°C to +125°C       |
| Lead Soldering Temperature (1/16 inch [1.6 mm] from case for 5 sec. with soldering iron) <sup>(1)</sup> | 240°C                 |
| Power Dissipation                                                                                       | 250 mW <sup>(2)</sup> |

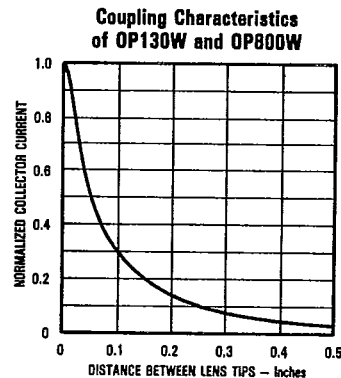
## Notes:

- (1) RMA flux is recommended. Duration can be extended to 10 sec. max. when wave soldering.
- (2) Derate linearly 2.5 mW/°C above 25°C.
- (3) Junction temperature maintained at 25°C.
- (4) Light source is an unfiltered tungsten bulb operating at CT = 2870°K or equivalent infrared source.

## Typical Performance Curves



Test Conditions (LED): T<sub>A</sub> = T<sub>J</sub> = 25°C, I<sub>c</sub> = 100 μA, DC = 0.1%, PW = 100 μs  
Peak Wavelength - λ<sub>p</sub>: (A) XSTR - 850 ± 30 nm, (B) LED GaAlAs - 875 ± 20 nm, (C) LED GaAs - 930 ± 15 nm



# Types OP800W, OP801W, OP802W

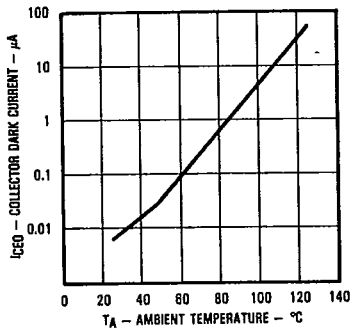
T-41-61

## Electrical Characteristics (T<sub>A</sub> = 25°C unless otherwise noted)

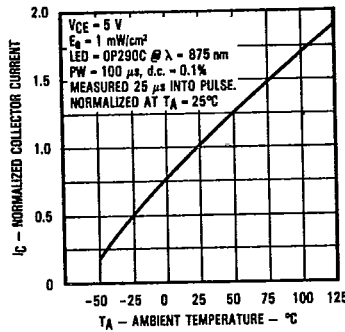
| Symbol                              | Parameter                            | Min.                                     | Typ. | Max. | Units | Test Conditions                                                                                                                                                                                                   |
|-------------------------------------|--------------------------------------|------------------------------------------|------|------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| I <sub>C(ON)</sub> <sup>(3)</sup>   | On-State Collector Current           | OP800W 0.30<br>OP801W 0.50<br>OP802W 2.5 |      | 3.0  | mA    | V <sub>CE</sub> = 5.0 V, E <sub>g</sub> = 5.0 mW/cm <sup>2(4)</sup><br>V <sub>CE</sub> = 5.0 V, E <sub>g</sub> = 5.0 mW/cm <sup>2(4)</sup><br>V <sub>CE</sub> = 5.0 V, E <sub>g</sub> = 5.0 mW/cm <sup>2(4)</sup> |
| I <sub>CEO</sub>                    | Dark Current                         |                                          |      | 100  | nA    | V <sub>CE</sub> = 10.0 V, E <sub>g</sub> = 0                                                                                                                                                                      |
| V <sub>(BR)CEO</sub>                | Collector-Emitter Breakdown Voltage  | 30                                       |      |      | V     | I <sub>C</sub> = 100 μA                                                                                                                                                                                           |
| V <sub>(BR)ECO</sub>                | Emitter-Collector Breakdown Voltage  | 5.0                                      |      |      | V     | I <sub>E</sub> = 100 μA                                                                                                                                                                                           |
| V <sub>CE(SAT)</sub> <sup>(3)</sup> | Collector-Emitter Saturation Voltage |                                          |      | 0.40 | V     | I <sub>C</sub> = 0.40 mA, E <sub>g</sub> = 5.0 mW/cm <sup>2(4)</sup>                                                                                                                                              |
| t <sub>r</sub>                      | Rise Time                            |                                          | 2.0  |      | μs    | V <sub>CC</sub> = 5.0 V, I <sub>C</sub> = 0.80 mA                                                                                                                                                                 |
| t <sub>f</sub>                      | Fall Time                            |                                          | 2.0  |      | μs    | R <sub>L</sub> = 100Ω, See Test Circuit                                                                                                                                                                           |

## Typical Performance Curves

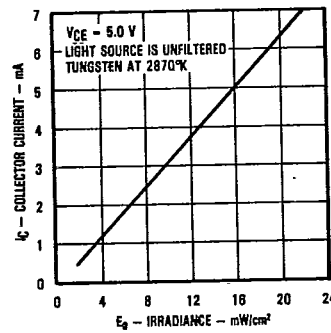
Collector Dark Current  
vs. Ambient Temperature



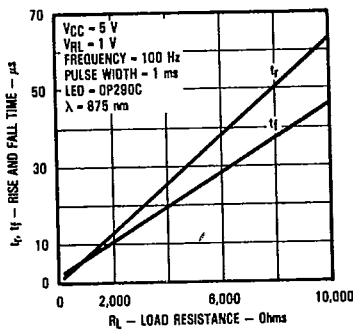
Normalized Collector Current  
vs. Ambient Temperature



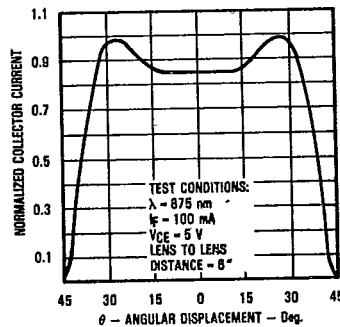
Collector Current  
vs. Irradiance



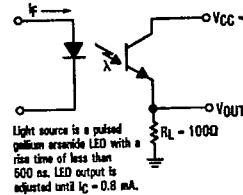
Rise and Fall Time  
vs. Load Resistance



Normalized Collector Current  
vs. Angular Displacement



Switching Time  
Test Circuit



TRW 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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