

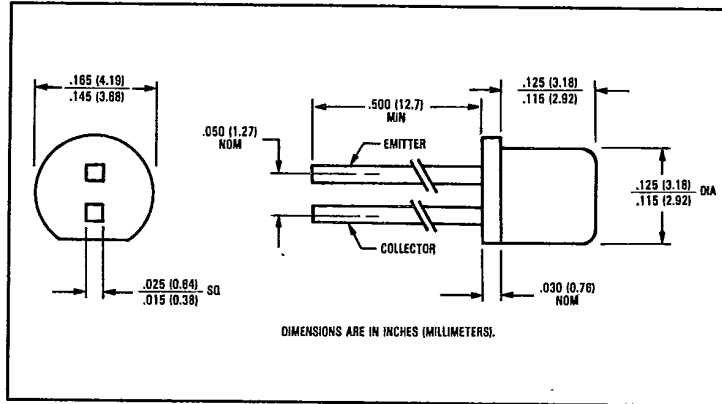
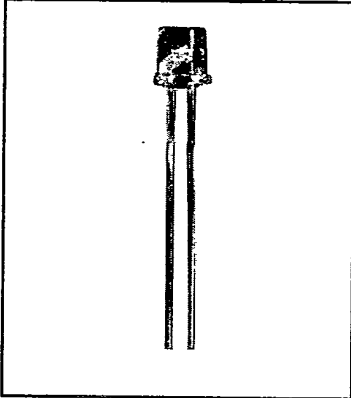
Optoelectronics Division
TRW Electronic Components Group

Product Bulletin 5095
January 1985

T-41-61

TRW

NPN Silicon Phototransistor Type OP500W



Features

- Flat lensed for wide acceptance angle
- .050" lead spacing
- Low cost plastic miniature plastic end-looking T-1 package.

Description

The OP500W consists of an NPN silicon phototransistor mounted in a flat lensed, clear plastic, end-looking package. The flat lens allows an acceptance half angle of 45° measured from the optical axis to the half power point. The OP500W is mechanically and spectrally matched to the OP160W infrared emitting diodes.

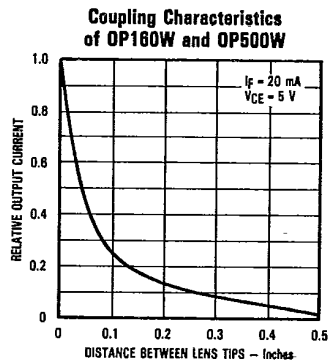
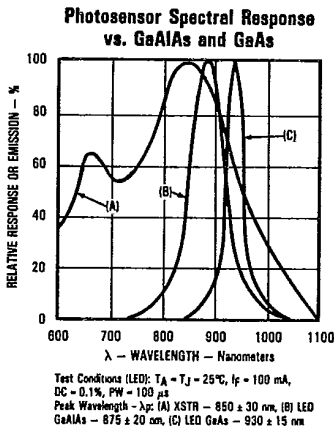
Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Collector-Emitter Voltage	30 V
Emitter-Collector Voltage	5.0 V
Storage and Operating Temperature Range	-40°C to $+100^\circ\text{C}$
Lead Soldering Temperature (1/16 inch (1.6 mm) from case for 5 sec. with soldering iron) ⁽¹⁾	240°C
Power Dissipation	100 mW ⁽²⁾

Notes:

- (1) RMA flux is recommended. Duration can be extended to 10 sec. max. when wave soldering.
- (2) Derate linearly 1.33 mW/°C above 25°C.
- (3) Junction temperature maintained at 25°C.
- (4) Light source is an unfiltered tungsten bulb operating at $T_f = 2870^\circ\text{K}$ or equivalent infrared source.
- (5) To calculate typical collector dark current in μA , use the formula $I_{CEQ} = 10^{0.040 T_A - 3.4}$ where T_A is ambient temperature in °C.

Typical Performance Curves



Type OP500W

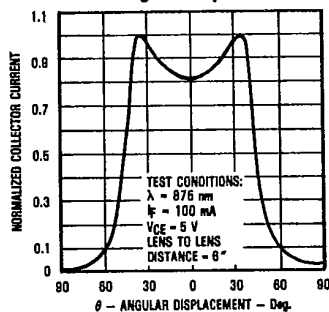
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Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

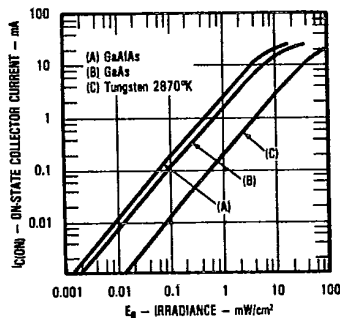
Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
$I_{C(ON)}^{(3)}$	On-State Collector Current	0.50			mA	$V_{CE} = 6.0\text{ V}$, $E_0 = 20\text{ mW/cm}^2$ ⁽⁴⁾
$\Delta I_C / \Delta T$	Relative I_C Changes with Temperature		1.00		%/°C	$V_{CE} = 6.0\text{ V}$, $E_0 = 1.00\text{ mW/cm}^2$, $\lambda = 875\text{ nm}$
$I_{C(D)}^{(5)}$	Collector Dark Current			100	nA	$V_{CE} = 15.0\text{ V}$, $E_0 = 0$
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	30			V	$I_C = 100\text{ }\mu\text{A}$
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	5.0			V	$I_E = 100\text{ }\mu\text{A}$
$V_{CE(SAT)}^{(3)}$	Collector-Emitter Saturation Voltage			0.40	V	$I_C = 250\text{ }\mu\text{A}$, $E_0 = 20\text{ mW/cm}^2$ ⁽⁴⁾

Typical Performance Curves

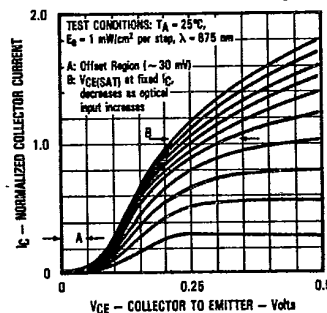
Normalized Collector Current vs. Angular Displacement



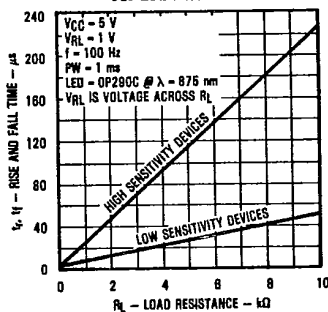
On-State Collector Current vs. Irradiance



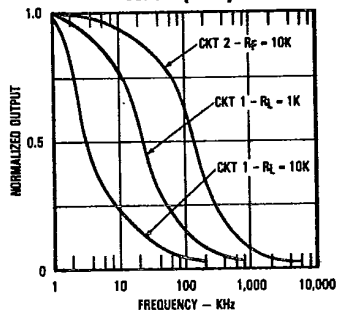
Normalized Collector Current vs. Collector to Emitter Voltage



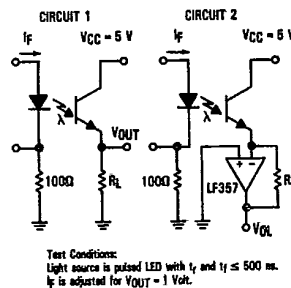
Rise and Fall Time vs. Load Resistance



Normalized Output vs. Frequency



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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