

T-41-61

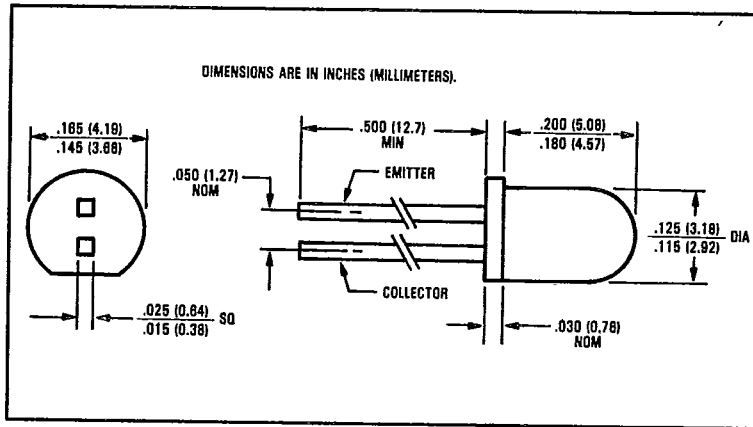
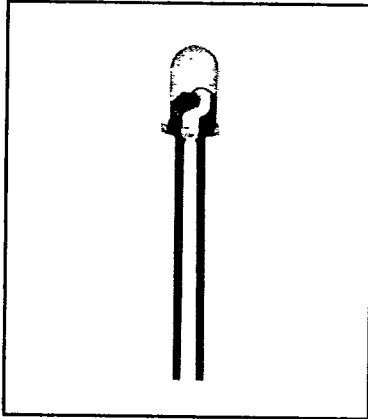


Optoelectronics Division  
TRW Electronic Components Group

Product Bulletin 5093  
January 1985

# NPN Silicon Phototransistors

## Types OP500, OP500SLD, OP500SLC, OP500SLB, OP500SLA



### Features

- Wide range of collector currents
- Lensed for high sensitivity
- Low cost plastic package

### Description

The OP500 and OP500SLD through SLA each consist of an NPN silicon phototransistor mounted in a lensed, clear plastic, end looking package. The lensing effect of the package allows an acceptance half angle of 8° measured from the optical axis to the half power point. This series is mechanically and spectrally matched to the OP160SL and OP260SL series of infrared emitting diodes.

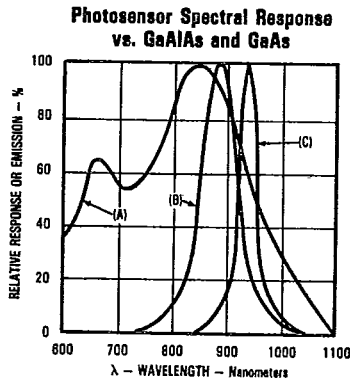
### Absolute Maximum Ratings (T<sub>A</sub> = 25°C unless otherwise noted)

Collector-Emitter Voltage .....	30 V
Emitter-Collector Voltage .....	5.0 V
Storage 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) <sup>(1)</sup> .....	240°C
Power Dissipation .....	100 mW <sup>(2)</sup>

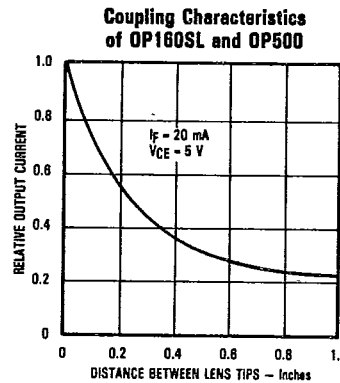
### Notes:

- (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 CT = 2870°K or equivalent infrared source.
- (5) To calculate typical collector dark current in  $\mu A$ , use the formula  $I_{CE0} = 10^{0.040 T_A - 3.4}$  where T<sub>A</sub> is ambient temperature in °C.

### Typical Performance Curves



Test Conditions (LED): T<sub>A</sub> = T<sub>J</sub> = 25°C, I<sub>F</sub> = 100 mA, DC = 0.1%, PM = 100  $\mu s$   
Peak Wavelength -  $\lambda_p$ : (A) XSTR - 850  $\pm$  30 nm, (B) LED GaAlAs - 875  $\pm$  20 nm, (C) LED GaAs - 930  $\pm$  15 nm

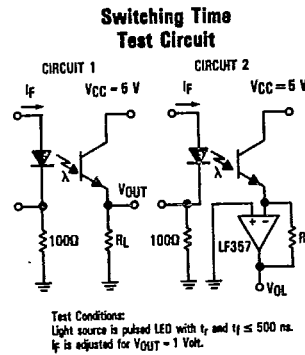
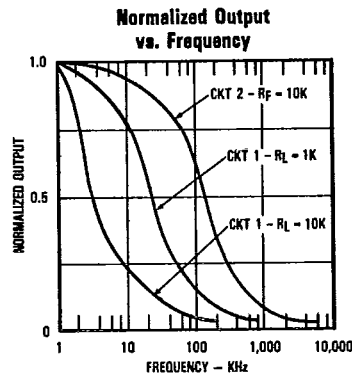
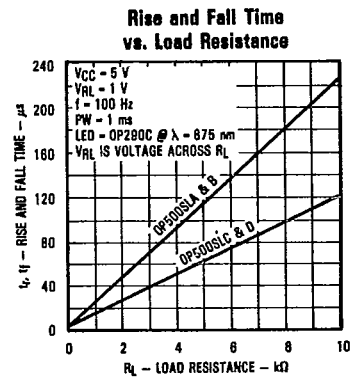
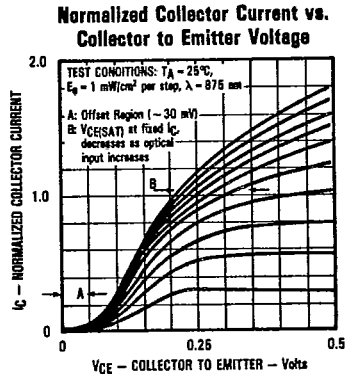
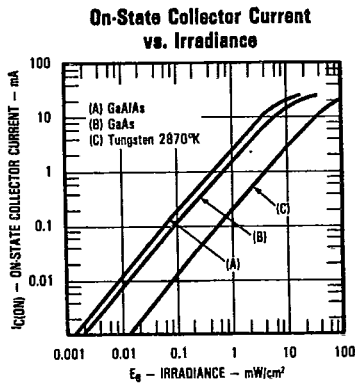
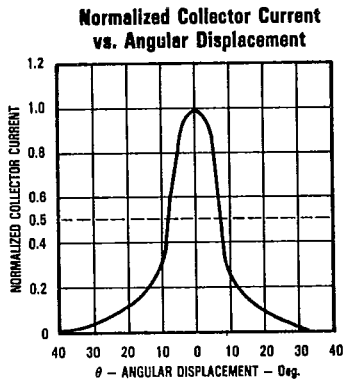


Types OP500, OP500SLD, OP500SLC, OP500SLB, OP500SLA T-41-61

Electrical Characteristics (TA = 25°C unless otherwise noted)

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions	
$I_{C(ON)}$ <sup>(3)</sup>	On-State Collector Current	OP500	4.0		24	mA	VCE = 5.0 V, Eg = 20 mW/cm <sup>2(4)</sup>
		OP500SLD	10.0			mA	VCE = 5.0 V, Eg = 20 mW/cm <sup>2(4)</sup>
		OP500SLC	17.0		35	mA	VCE = 5.0 V, Eg = 20 mW/cm <sup>2(4)</sup>
		OP500SLB	25		50	mA	VCE = 5.0 V, Eg = 20 mW/cm <sup>2(4)</sup>
		OP500SLA	40			mA	VCE = 5.0 V, Eg = 20 mW/cm <sup>2(4)</sup>
$\Delta I_C/\Delta T$	Relative $I_C$ Changes with Temperature		1.00		%/°C	VCE = 5.0 V, Eg = 1.00 mW/cm <sup>2</sup> , $\lambda = 875$ nm	
$I_{CE0}$ <sup>(5)</sup>	Collector Dark Current			100	nA	VCE = 15.0 V, Eg = 0	
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	30			V	$I_C = 100 \mu A$	
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	5.0			V	$I_E = 100 \mu A$	
$V_{CE(SAT)}$ <sup>(3)</sup>	Collector-Emitter Saturation Voltage			0.40	V	$I_C = 0.50$ mA, Eg = 20 mW/cm <sup>2(4)</sup>	

Typical Performance Curves



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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