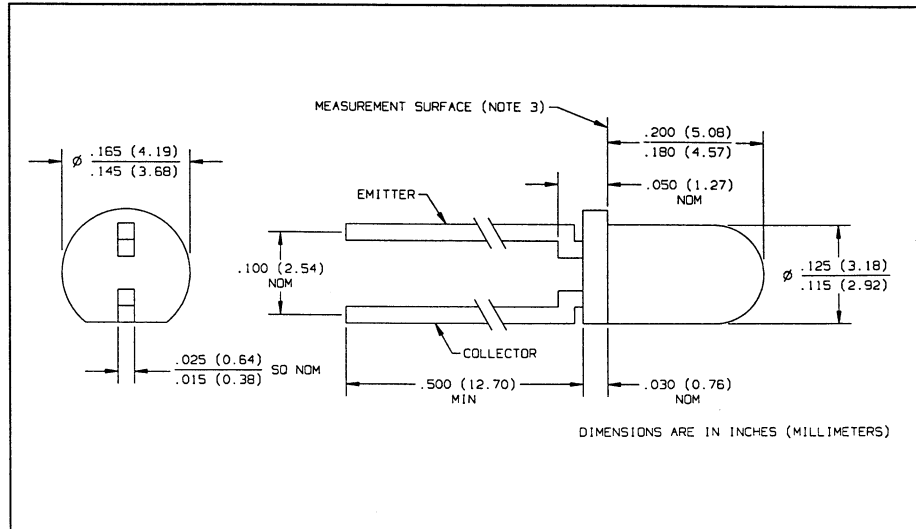
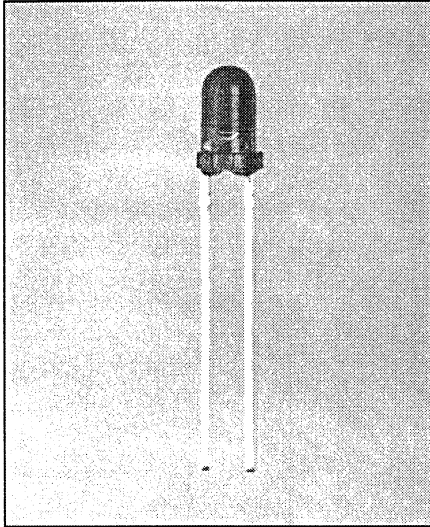


# NPN Silicon Phototransistors

## Types OP506A, OP506B, OP506C, OP506D



### Features

- Narrow receiving angle
- Variety of sensitivity ranges
- T-1 package style
- Small package size for space limited applications

### Description

The OP506 series devices consist of NPN silicon phototransistors molded in blue tinted epoxy packages. The narrow receiving angle provides excellent on-axis coupling. These devices are 100% production tested using infrared light for close correlation with Optek's GaAs and GaAlAs emitters. Lead spacing is 0.100" (2.54mm).

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

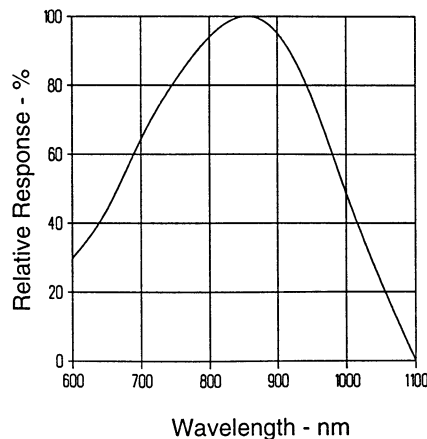
Collector-Emitter Voltage .....	30 V
Emitter-Collector Voltage .....	5.0 V
Storage and Operating Temperature Range .....	$-40^\circ\text{C}$ to $+100^\circ\text{C}$
Lead Soldering Temperature [1/16 inch (1.6 mm) from case for 5 sec. with soldering iron] .....	$260^\circ\text{C}^{(1)}$
Power Dissipation .....	100 mW <sup>(2)</sup>

#### Notes:

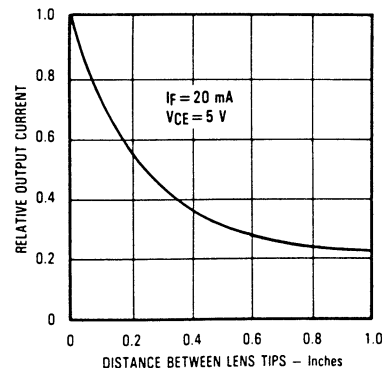
- (1) RMA flux is recommended. Duration can be extended to 10 sec. max. when flow soldering. Max. 20 grams force may be applied to leads when soldering.
- (2) Derate linearly 1.33 mW/ $^\circ\text{C}$  above  $25^\circ\text{C}$ .
- (3) Light source is an unfiltered GaAs LED with a peak emission wavelength of 935 nm and a radiometric intensity level which varies less than 10% over the entire lens surface of the phototransistor being tested.
- (4) To calculate typical collector dark current in  $\mu\text{A}$ , use the formula  $I_{CED} = 10^{(0.040 T_A - 3.4)}$  where  $T_A$  is ambient temperature in  $^\circ\text{C}$ .

### Typical Performance Curves

Typical Spectral Response



Coupling Characteristics of OP166 and OP506



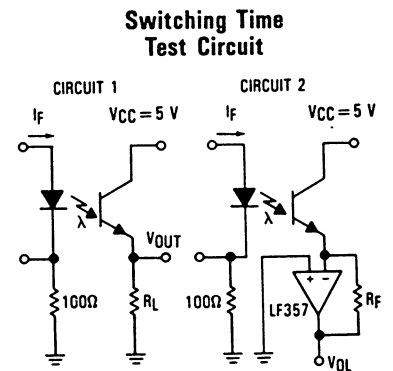
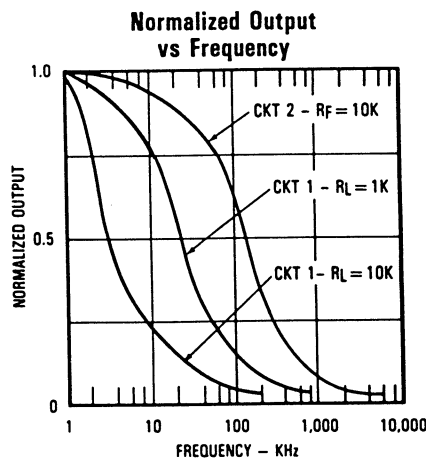
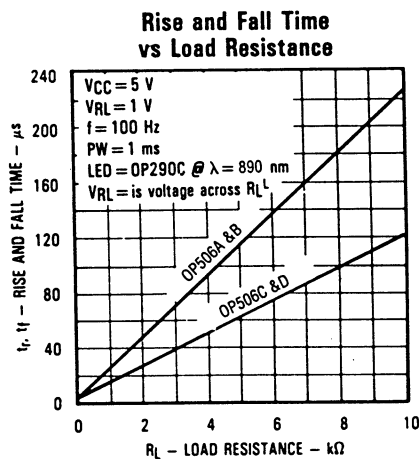
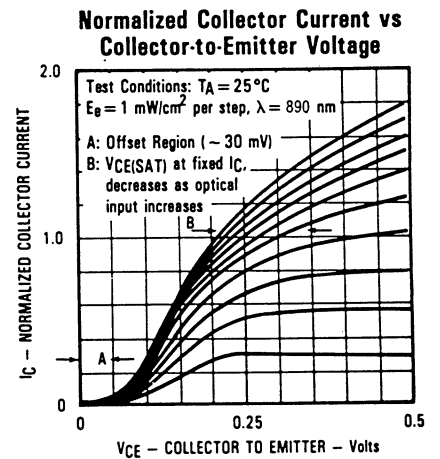
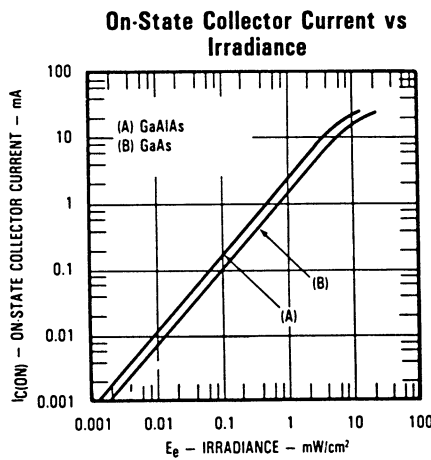
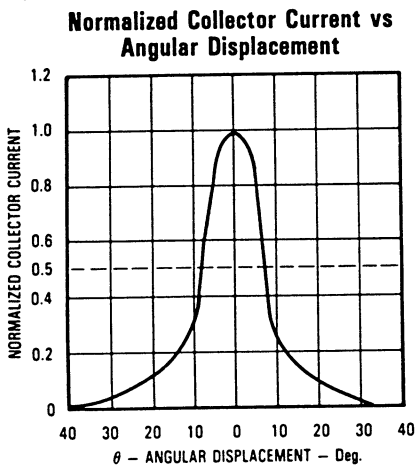
# Types OP506A, OP506B, OP506C, OP506D

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

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
$I_{C(ON)}$	On-State Collector Current	OP506D	0.55		mA	$V_{CE} = 5\text{ V}, E_e = 0.50\text{ mW/cm}^2$ <sup>(4)</sup>
		OP506C	1.10	3.00	mA	$V_{CE} = 5\text{ V}, E_e = 0.50\text{ mW/cm}^2$ <sup>(4)</sup>
		OP506B	2.15	5.95	mA	$V_{CE} = 5\text{ V}, E_e = 0.50\text{ mW/cm}^2$ <sup>(4)</sup>
		OP506A	4.30		mA	$V_{CE} = 5\text{ V}, E_e = 0.50\text{ mW/cm}^2$ <sup>(4)</sup>
$\Delta I_C/\Delta T$	Relative $I_C$ Changes with Temperature		1.00		%/ $^\circ\text{C}$	$V_{CE} = 5\text{ V}, E_e = 1.0\text{ mW/cm}^2$
$I_{CEO}$	Collector Dark Current			100	nA	$V_{CE} = 10\text{ V}, E_e = 0$ <sup>(4)</sup>
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	30			V	$I_C = 100\text{ }\mu\text{A}$
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	5.0			V	$I_E = 100\text{ }\mu\text{A}$
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage			0.40	V	$I_C = 250\text{ mA}, E_e = 0.50\text{ mW/cm}^2$ $\lambda = 935\text{ nm}$ <sup>(3)</sup>

PHOTOSENSORS

## Typical Performance Curves



Test Conditions:  
Light source is pulsed LED with  $t_r$  and  $t_f \leq 500\text{ ns}$ .  
 $I_f$  is adjusted for  $V_{OUT} = 1\text{ Volt}$ .