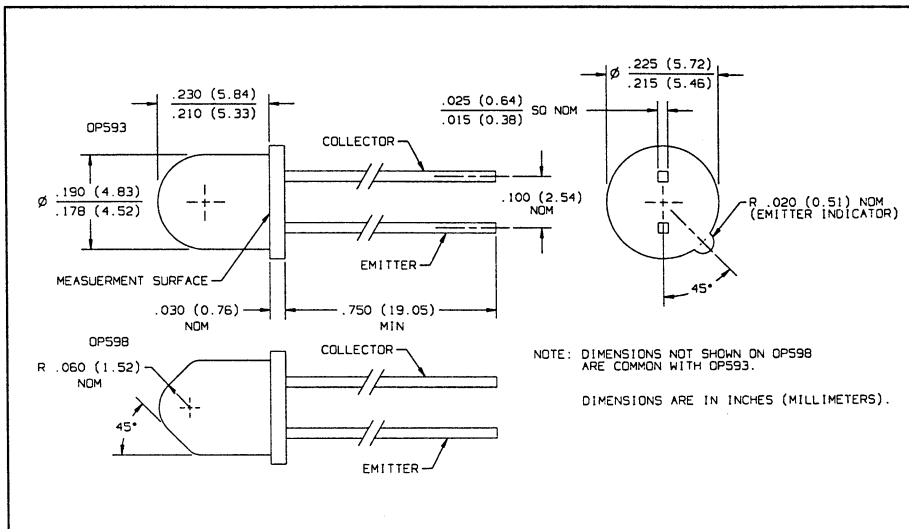
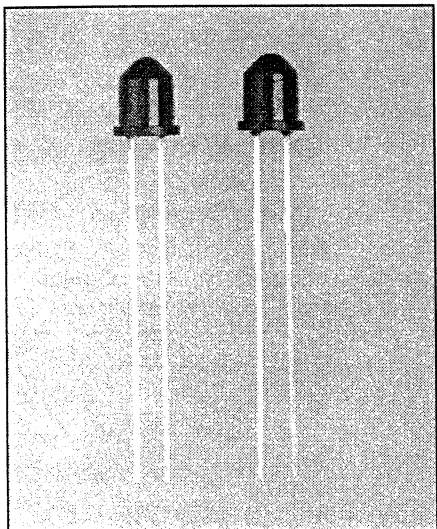


# NPN Plastic Silicon Phototransistors

## Types OP593, OP598 Series



### Features

- Wide receiving angle
- Variety of sensitivity ranges
- TO-18 equivalent package style

### Description

The OP593/598 series consist of NPN silicon phototransistors molded in dark blue epoxy packages. The wide receiving angle provides relatively even reception over a large area. These devices are 100% production tested using infrared light for close correlation with Optek's GaAs and GaAlAs emitters.

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

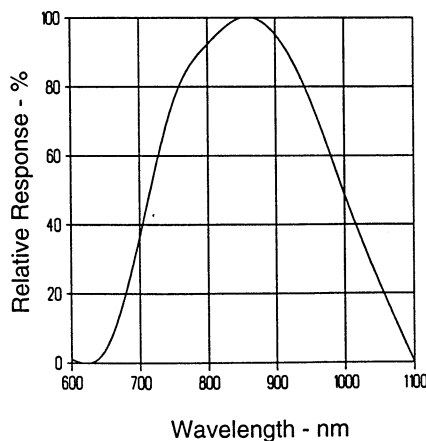
Collector-Emitter Voltage	30 V
Emitter-Collector Voltage	5.0 V
Continuous Collector Current	50 mA
Storage and Operating Temperature Range	$-40^\circ\text{C}$ to $+100^\circ\text{C}$
Lead Soldering Temperature [1/16 inch (1.6 mm) from case for 5 sec. with soldering iron]	$260^\circ\text{C}^{(1)}$
Power Dissipation	$250\text{mW}^{(2)}$

#### 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  $3.33\text{mW}/^\circ\text{C}$  above  $25^\circ\text{C}$ .
- (3)  $V_{CE} = 5\text{V}$ . Light source is an unfiltered GaAlAs emitting diode operating at peak emission wavelength of 890 nm and  $E_{e(\text{APT})}$  of  $1.7\text{mW}/\text{cm}^2$  average within a .250" dia. aperture.
- (4) This dimension is held to within  $\pm 0.005$ " on the flange edge and may vary up to  $\pm 0.020$ " in the area of the leads.

### Typical Performance Curves

Typical Spectral Response



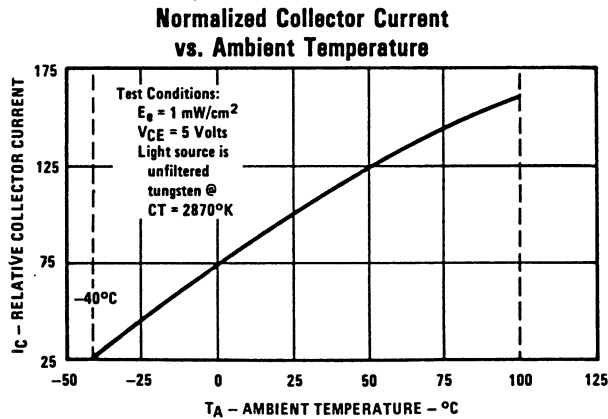
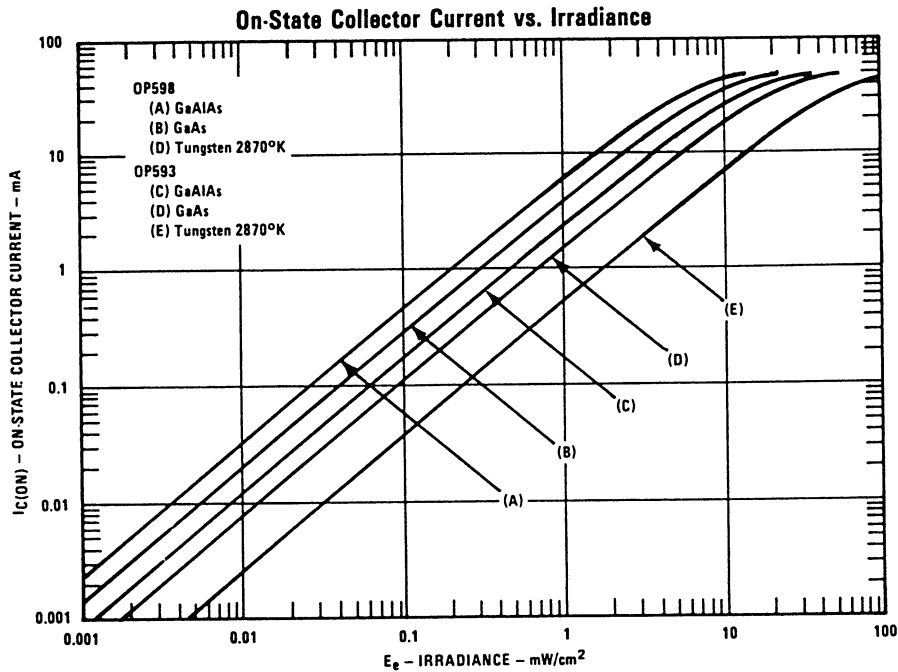
# Types OP593, OP598 Series

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	OP593C	1.0			See Note (3)
		OP593B	2.0		4.0	
		OP593A	3.0			
		OP598C	2.5			See Note (3)
		OP598B	5.0		10	
		OP598A	7.5			
$I_{CEO}$	Collector Dark Current			100	nA	$V_{CE} = 10\text{ V}, E_e = 0$
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	30			V	$I_C = 100\ \mu\text{A}$
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	5			V	$I_E = 100\ \mu\text{A}$
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage			0.40	V	$I_C = 0.4\text{ mA}, E_e = 1.7\text{ mW/cm}^2(3)$

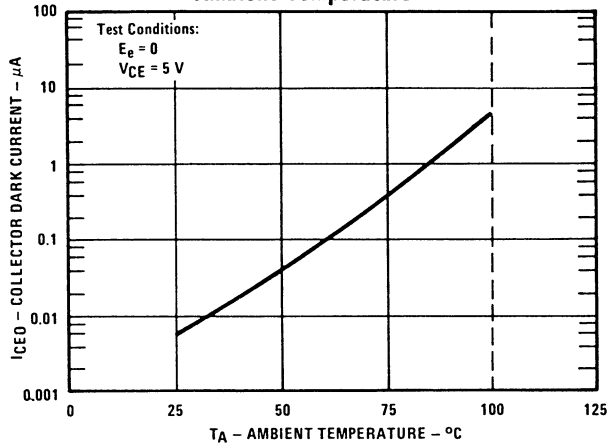
PHOTOSENSORS

## Typical Performance Curves

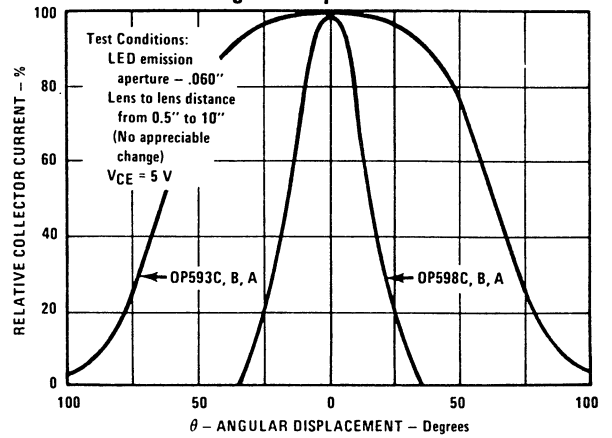


## Typical Performance Curves

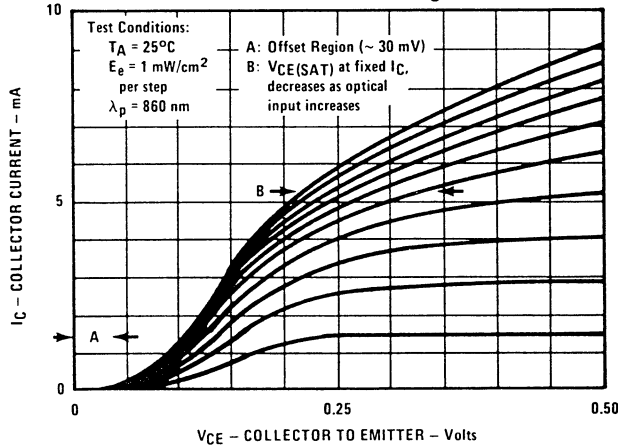
### Collector Dark Current vs. Ambient Temperature



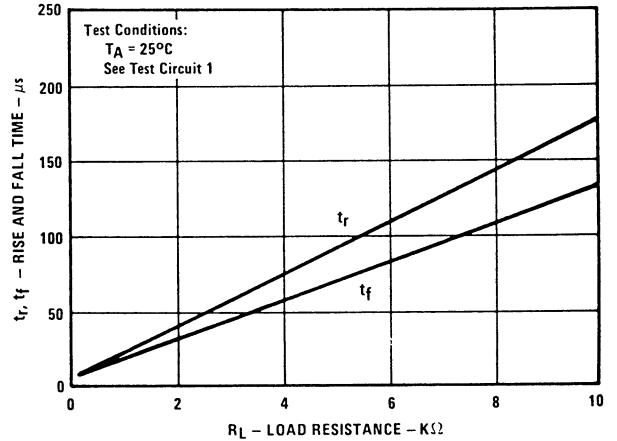
### Relative Collector Current vs. Angular Displacement



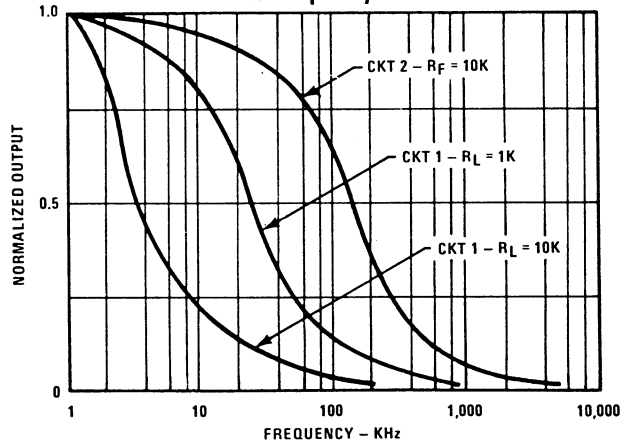
### Collector Current vs. Collector to Emitter Voltage



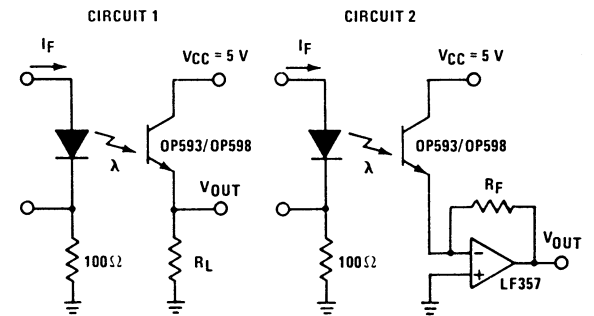
### Rise and Fall Time vs. Load Resistance



### Normalized Output vs. Frequency



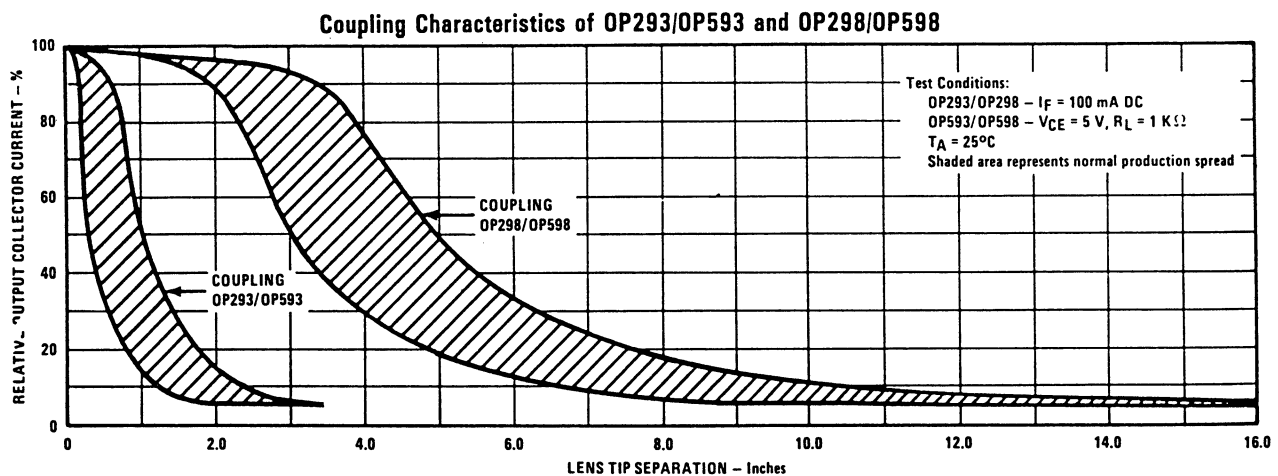
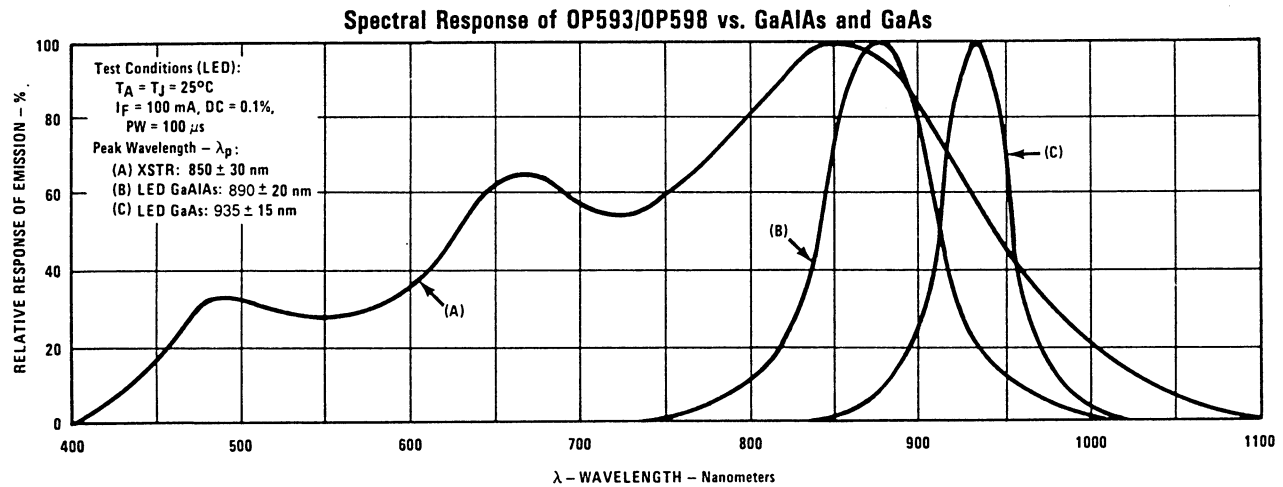
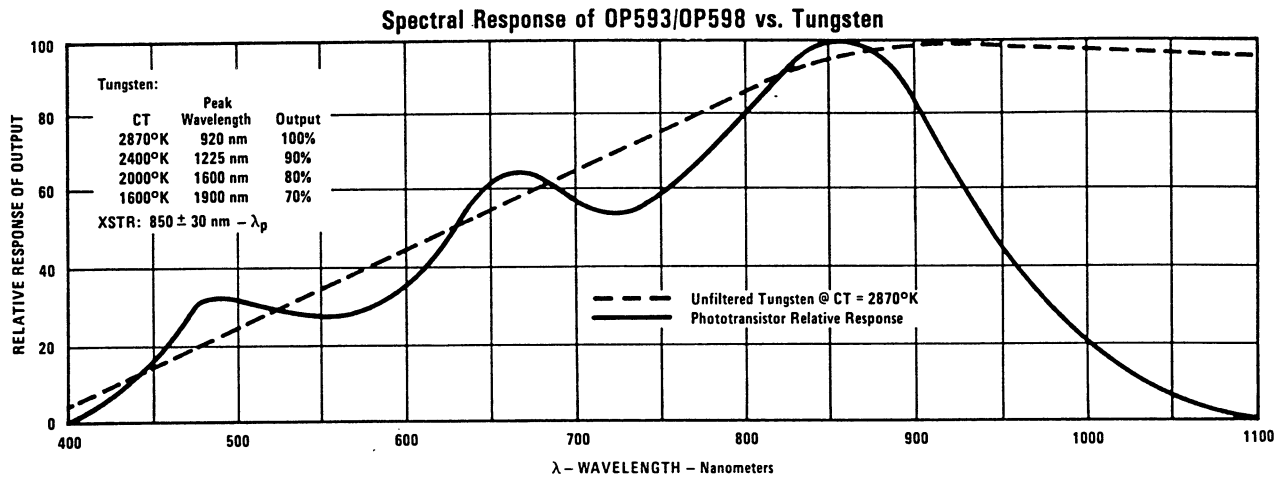
### Switching Time Test Circuit



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

# Types OP593, OP598 Series

## Typical Performance Curves



PHOTOSENSORS