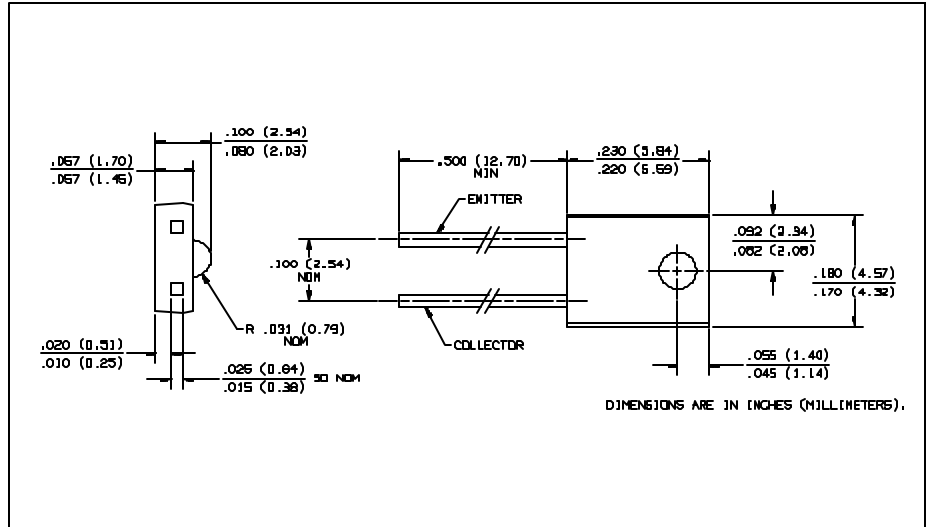
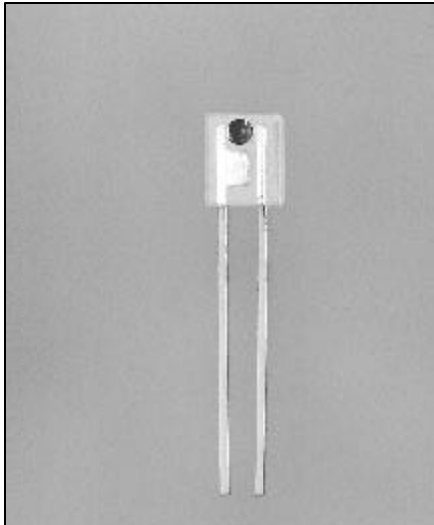


# NPN Phototransistor with Base-Emitter Resistor Types OP750A, OP750B, OP750C, OP750D



## Features

- Wide receiving angle
- Variety of sensitivity ranges
- Side-looking package for space limited applications
- Base-emitter resistor provides ambient light protection

## Description

The OP750 series devices consist of an NPN silicon phototransistor molded in a clear epoxy package. The wide receiving angle provides relatively even reception over a large area. The side-looking package is designed for easy PC board mounting of slotted optical switches or optical interrupt detectors. This series is mechanically and spectrally matched to the OP140 and OP240 series of infrared emitting diodes.

The phototransistor has an internal base-emitter resistor which provides protection from low level ambient lighting conditions. This feature is also useful when the media being detected is semi-transparent to infrared light in interruptive applications.

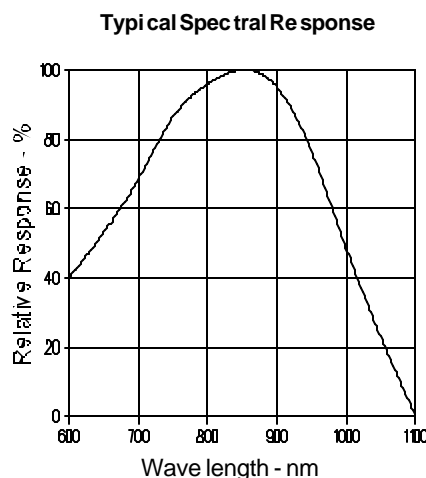
## Absolute Maximum Ratings ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

Collector-Emitter Voltage	30 V
Emitter Reverse Current	10 mA
Collector DC Current	30 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	200 mW <sup>(2)</sup>

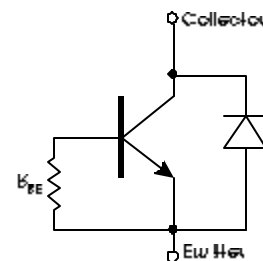
## NOTES:

- (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) The knee point irradiance is defined as the irradiance required to increase  $I_{C(ON)}$  to 50  $\mu\text{A}$ .

## Typical Performance Curves



## Schematic



# Types OP750A, OP750B, OP750C, OP750D

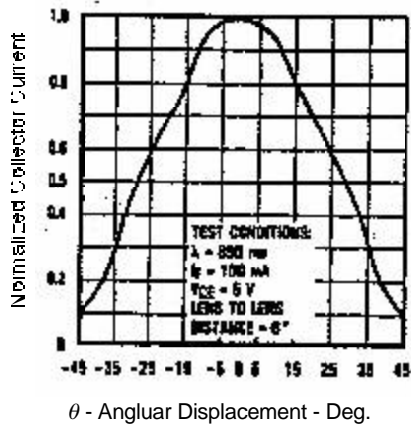
Electrical Characteristics ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
$I_{C(ON)}$	On-State Collector Current	OP750A	2.25	7.00	mA	$V_{CE} = 5\text{ V}$ , $E_e = 1\text{ mW/cm}^2(3)$
		OP750B	1.50	4.20		
		OP750C	0.85	2.80		
		OP750D	0.85	7.00		
$E_{KP}$	Knee Point Irradiance		.03		$\text{mW/cm}^2$	$V_{CE} = 5\text{ V}(4)$
$I_{CEO}$	Collector-Emitter Dark Current			100	nA	$V_{CE} = 10\text{ V}$ , $E_e = 0$
$I_{ECO}$	Emitter-Reverse Current			100	$\mu\text{A}$	$V_{EC} = 0.4\text{ V}$
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	30			V	$I_C = 100\text{ }\mu\text{A}$
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage			0.4	V	$I_C = 100\text{ }\mu\text{A}$ , $E_e = 1\text{ mW/cm}^2(3)$

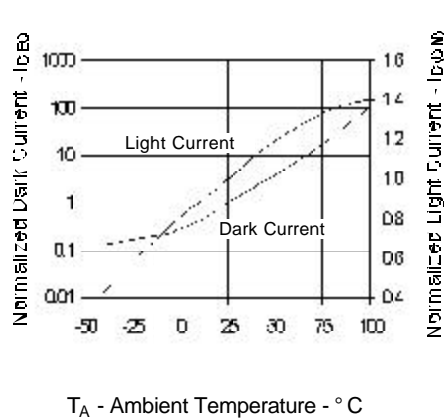
PHOTOSENSORS

## Typical Performance Curves

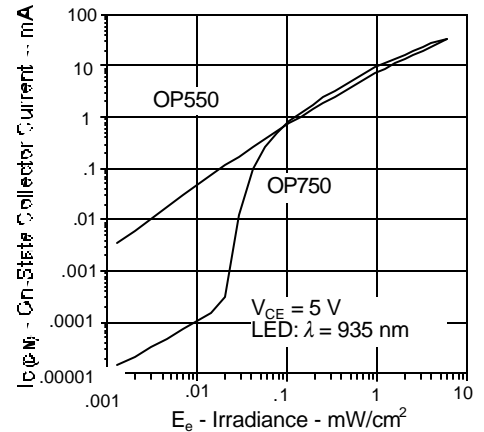
Normalized Collector Current vs. Angular Displacement



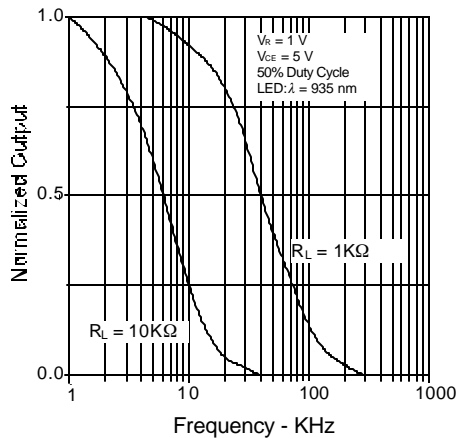
Normalized Light and Dark Current vs. Ambient Temperature



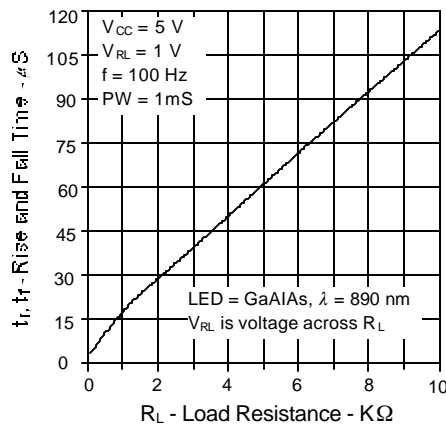
On-State Collector Current vs. Irradiance



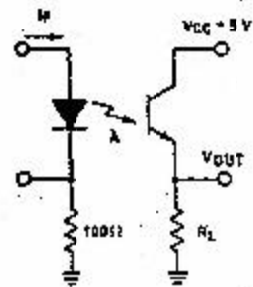
Normalized Output vs. Frequency



Typical Rise and Fall Time vs. Load Resistance



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  $V_{OUT} = 1\text{ Volt}$ .