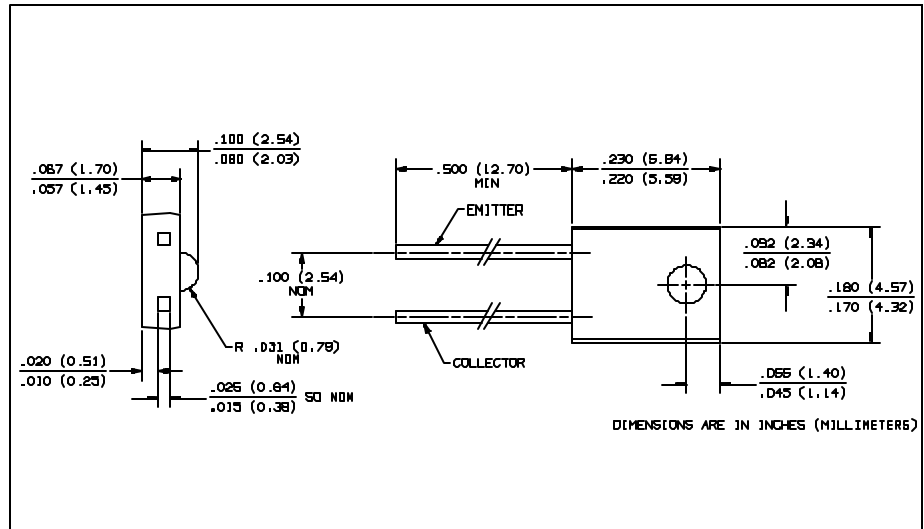


Product Bulletin OP770A  
February 2000

# NPN Phototransistor with Collector-Emitter Capacitor Types OP770A, OP770B, OP770C, OP770D



### Features

- Suppresses high frequency noise
- Variety of sensitivity ranges
- Wide receiving angle
- Side looking package for space limited applications

### Description

The OP770 consists of an NPN phototransistor and 1000 pF capacitor molded in a clear epoxy package. The internal collector-emitter capacitor allows the device to be used in applications where external high frequency emissions could compromise signal integrity.

The device's wide receiving angle provides relatively even reception over a large area.

The OP770 is 100% production tested using an infrared light source for close correlation with Optek's GaAs and GaAlAs emitters.

Side-looking package is designed for easy PC board mounting of slotted optical switches or optical interrupt detectors.

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

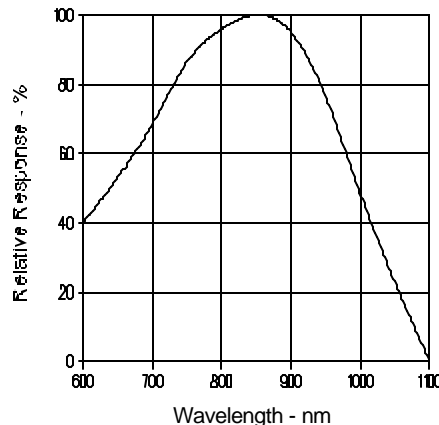
Collector-Emitter Voltage	30 V
Emitter-Collector Voltage	5.0 V
Storage and Operating Temperature Range	-40° C to +100° C
Lead Soldering Temperature [1/16 inch (1.6 mm) from case for 5 sec. with soldering iron]	260° C <sup>(1)</sup>
Power Dissipation	100 mW <sup>(2)</sup>

#### Notes:

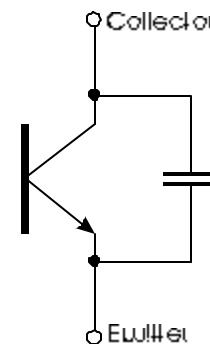
- (1) RMA flux is recommended. Duration can be extended to 10 sec. max. when flow soldering. Max. 20 grams force may be applied to leads when soldering.
- (2) Derate linearly 1.33 mW/°C above 25° C.
- (3) Light source is an unfiltered GaAs LED with a peak emission wavelength of 935 nm and a radiometric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

### Typical Performance Curves

Typical Spectral Response



Schematic



# Types OP770A, OP770B, OP770C, OP770D

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 OP770D OP770C OP770B OP770A	0.85 0.85 1.50 2.25		7.00 2.80 4.20 7.00	mA	$V_{CE} = 5.0\text{ V}$ , $E_e = 1.0\text{ mW/cm}^2(3)$
$\Delta I_C/\Delta T$	Relative IC Changes with Temperature		100		%/ $^\circ\text{C}$	$V_{CE} = 5.0\text{ V}$ , $E_e = 1.0\text{ mW/cm}^2$ , $\lambda = 935\text{ nm}$
$I_{CEO}$	Collector Dark Current			100	nA	$V_{CE} = 10.0\text{ V}$ , $E_e = 0$
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	5.0			V	$I_E = 100\text{ }\mu\text{A}$
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage			0.40	V	$I_C = 100\text{ }\mu\text{A}$ , $E_e = 1.0\text{ mW/cm}^2(3)$
$C_{CE}$	Capacitance		1000		pF	$V_R = 0$

## Typical Performance Curves

