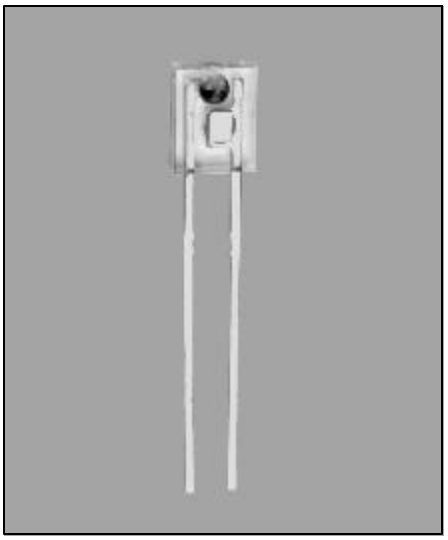
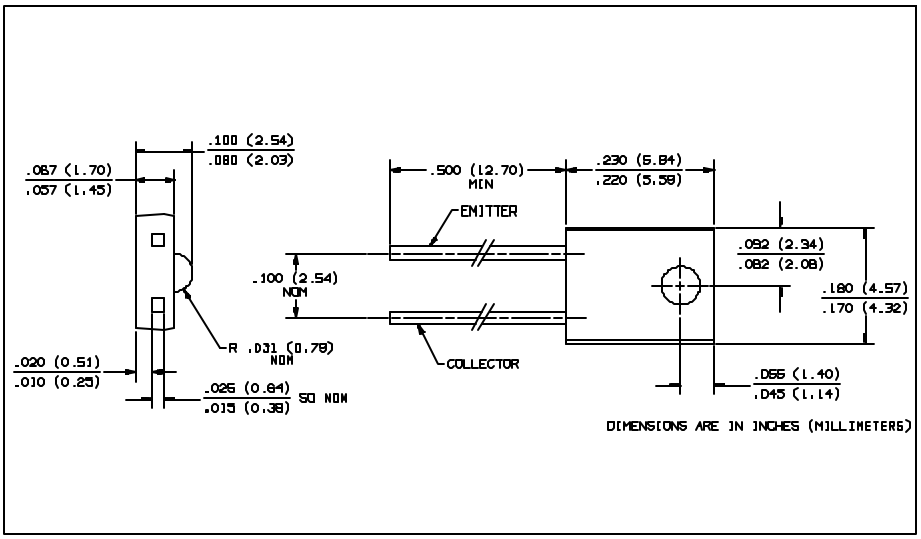
NPN Phototransistor with Collector-Emitter Capacitor
Types OP770A, OP770B, OP770C, OP770D





Features

- Supresses 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.

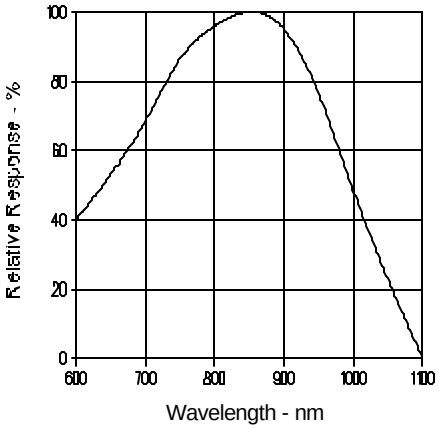
Absolute Maximum Ratings (T_A = 25° C unless otherwise noted)

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(1)
Power Dissipation . . . . . 100 mW(2)

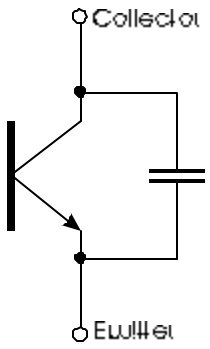
Notes:
(1) RMA flux is recommended. Duration can be extended to 10 sec. max. when flow soldering. Max. 20 grams force may be applied to leads when soldering.
(2) Derate linearly 1.33 mW/° C above 25° C.
(3) Light source is an unfiltered GaAs LED with a peak emission wavelength of 935 nm and a radiometric 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 µA, use the formula $I_{CED} = 10^{(0.040T_A - 3.4)}$ when T_A is ambient temperature in °C.

Typical Performance Curves

Typical Spectral Response



Schematic



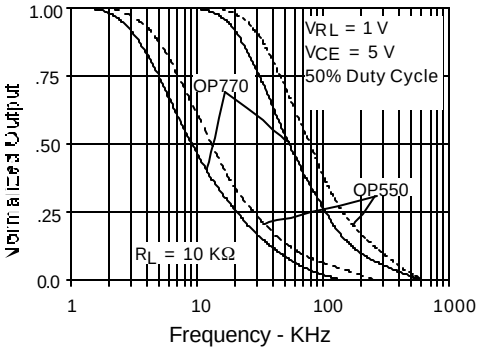
Types OP770A, OP770B, OP770C, OP770D

Electrical Characteristics (T_A = 25° 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 V, E_e = 1.0 mW/cm^2 (3)
$\Delta I_C/\Delta T$	Relative IC Changes with Temperature			100		%/ ° C	V_{CE} = 5.0 V, E_e = 1.0 mW/cm^2, λ = 935 nm
I_{CEO}	Collector Dark Current				100	nA	V_{CE} = 10.0 V, E_e = 0
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage		5.0			V	I_E = 100 μA
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage				0.40	V	I_C = 100 µA, E_e = 1.0 mW/cm^2 (3)
C_{CE}	Capacitance			1000		pF	V_R = 0

Typical Performance Curves

Normalized Output vs. Frequency



Typical Rise and Fall Time vs. Load Resistance