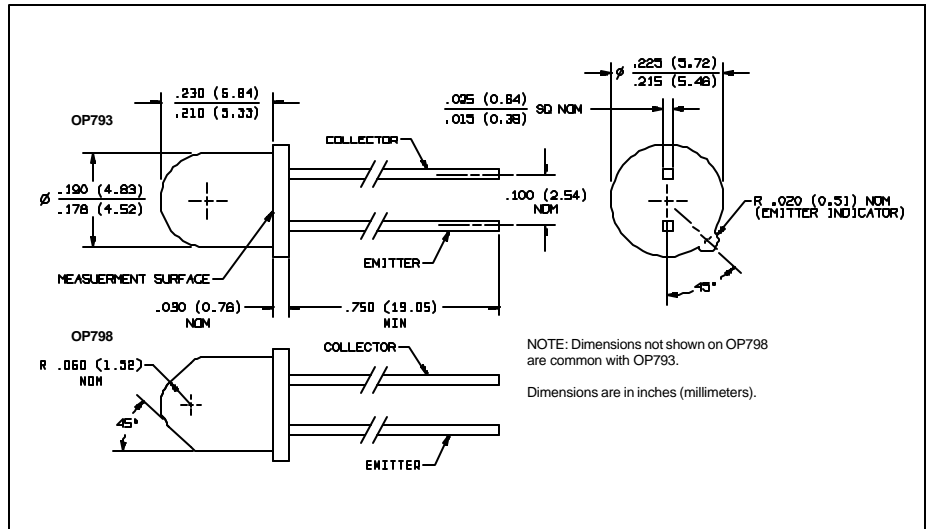


# NPN Phototransistor with Base-Emitter Resistor Types OP793, OP798 Series



## Features

- Variety of sensitivity ranges
- TO-18 equivalent package style
- Base-emitter resistor provides ambient light protection

## Description

The OP793/OP798 series consists of NPN silicon phototransistors molded in dark blue epoxy packages. These devices are 100% production tested using infrared light for close correlation with Optek's GaAs and GaAlAs emitters.

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.

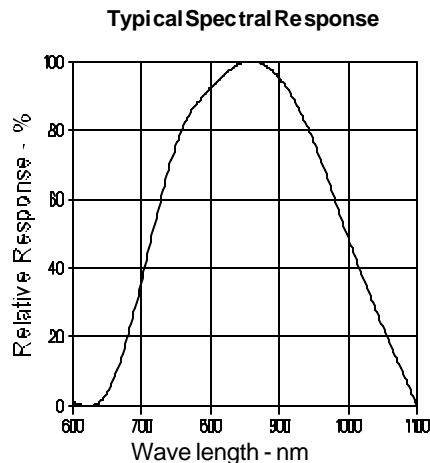
## Absolute Maximum Ratings ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

Collector-Emitter Voltage	30 V
Emitter Reverse Current	10 mA
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	$250\text{ mW}^{(2)}$

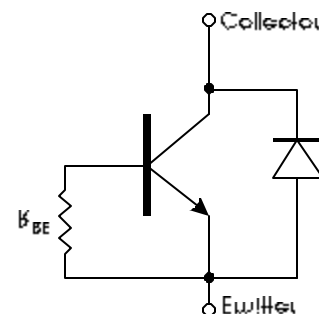
### Notes:

- (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  $E_{e(APT)}$  of  $1.7\text{ mW}/\text{cm}^2$  average within a  $.250''$  dia. aperture.
- (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 OP793, OP798 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					$V_{CE} = 5\text{ V}, E_e = 1.7\text{ mW/cm}^{2(3)}$
	OP793A	2.45		7.50	mA	
	OP793B	1.65		4.55		
	OP793C	0.90		3.05		
OP793D	0.90		7.50			
$I_{C(ON)}$	On-State Collector Current					$V_{CE} = 5\text{ V}, E_e = 1.7\text{ mW/cm}^{2(3)}$
	OP798A	4.90		15.0	mA	
	OP798B	3.30		9.20		
	OP798C	1.90		6.10		
OP798D	1.90		15.0			
$E_{KP}$	Knee Point Irradiance				mW/cm <sup>2</sup>	$V_{CE} = 5\text{ V}^{(4)}$
	OP793		.10			
OP798			.04			
$I_{CEO}$	Collector-Emitter Dark Current			100	nA	$V_{CE} = 10\text{ V}, E_e = 0$
$I_{ECO}$	Emitter-Reverse Current			100	$\mu\text{A}$	$V_{CE} = 0.4\text{ V}$
$V_{(BR)ECO}$	Collector-Emitter Breakdown Voltage	30			V	$I_C = 100\text{ }\mu\text{A}$
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage			0.4	V	$I_C = 0.4\text{ mA}, E_e = 1.7\text{ mW/cm}^{2(3)}$

PHOTOSENSORS

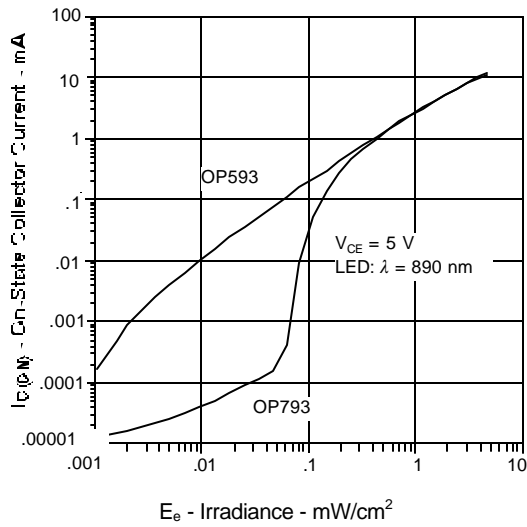
Op tek reserves the right to make changes at any time in order to improve design and to supply the best product possible.

Op tek Technology, Inc. 1215 W. Crosby Road Carrollton, Texas 75006 (972) 323- 2200 Fax (972) 323- 2396

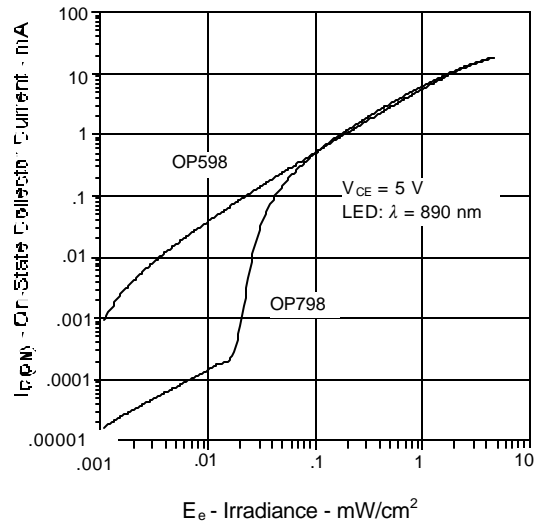
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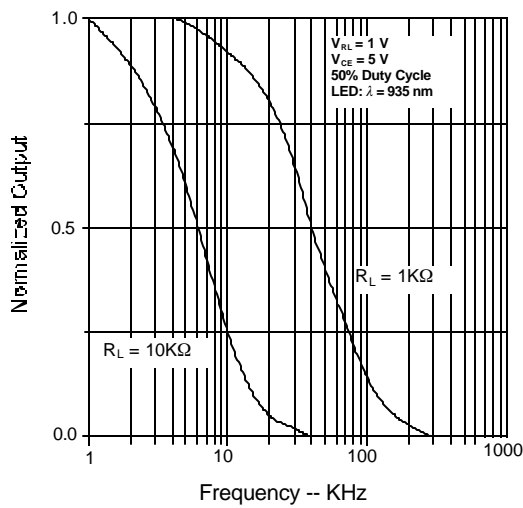
**On-State Collector Current vs. Irradiance**



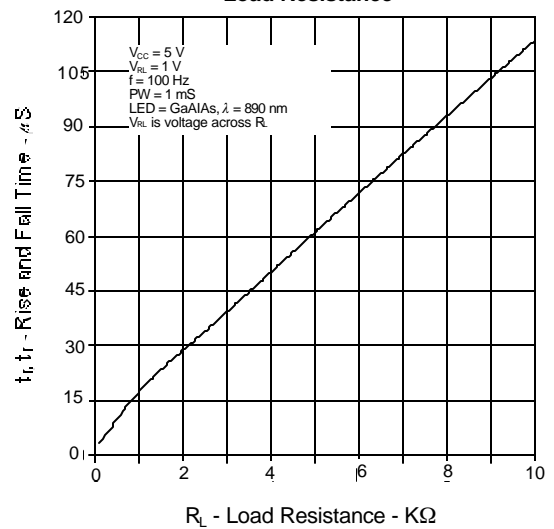
**On-State Collector Current vs. Irradiance**



**Normalized Output vs. Frequency**



**Typical Rise and Fall Time vs. Load Resistance**



**Normalized Light and Dark Current vs. Ambient Temperature**

