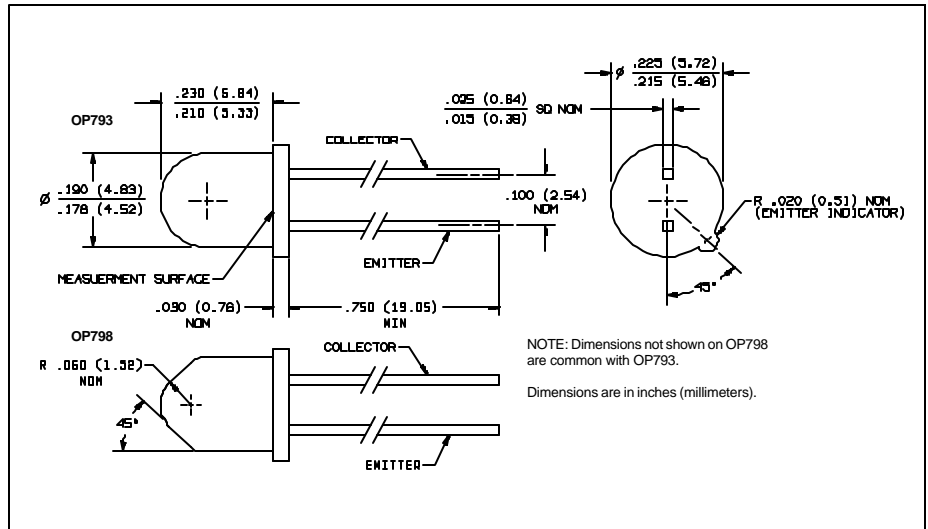


# NPN Phototransistor with Base-Emitter Resistor Types OP793, OP798 Series



## 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.

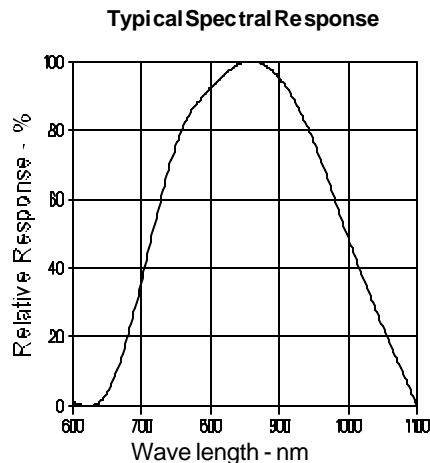
## Absolute Maximum Ratings ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

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	$250\text{ mW}^{(2)}$

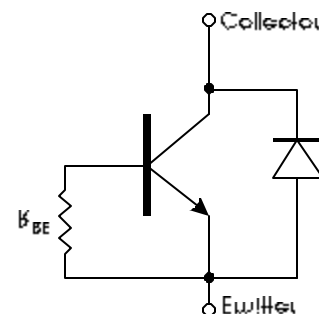
### Notes:

- (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  $E_{e(\text{APT})}$  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  $I_{C(\text{ON})}$  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

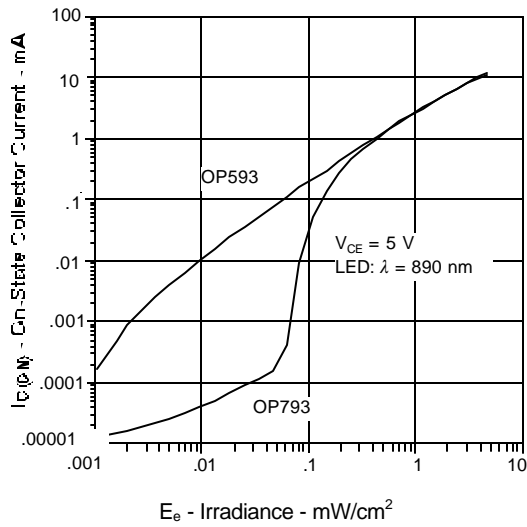
Op tek reserves the right to make changes at any time in order to improve design and to supply the best product possible.

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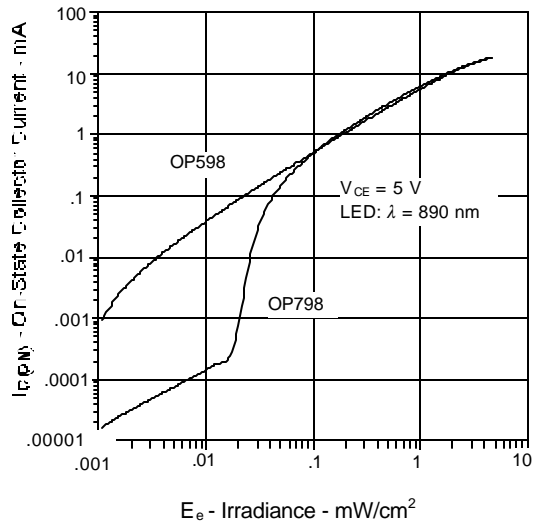
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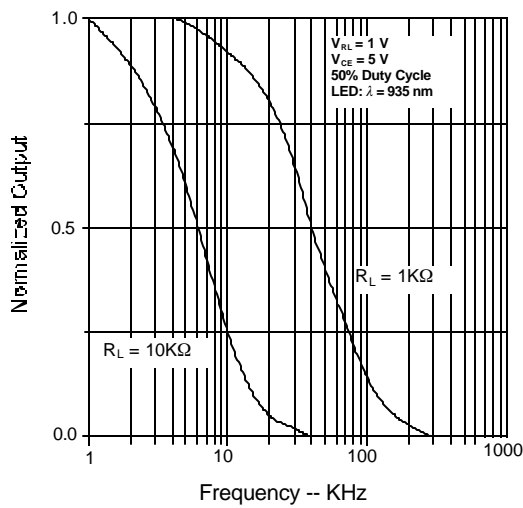
**On-State Collector Current vs. Irradiance**



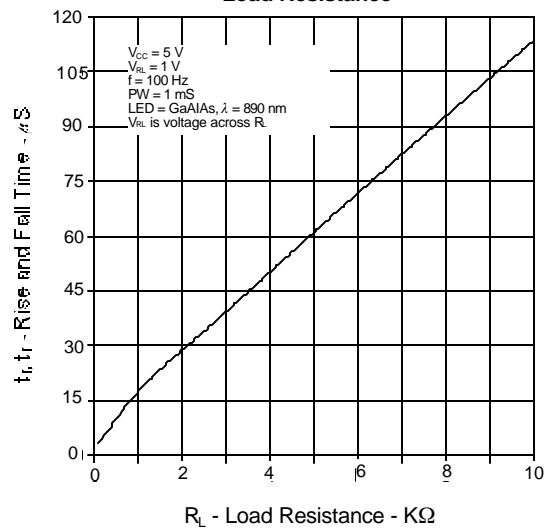
**On-State Collector Current vs. Irradiance**



**Normalized Output vs. Frequency**



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



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

