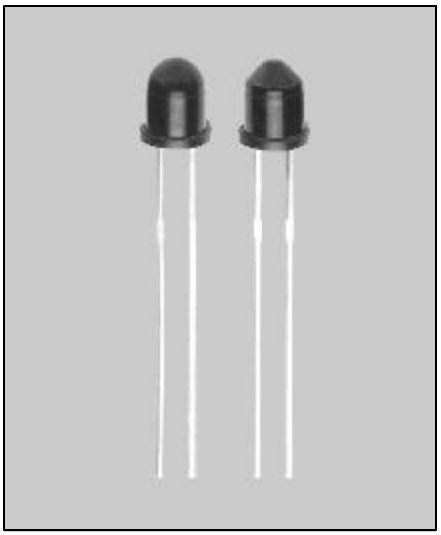
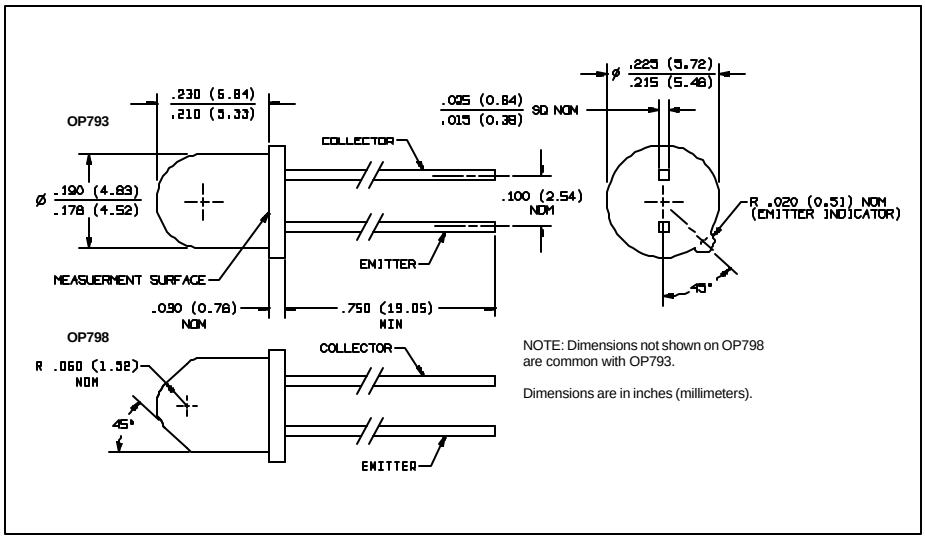
NPN Phototransistor with Base-Emitter Resistor Types OP793, OP798 Series





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.

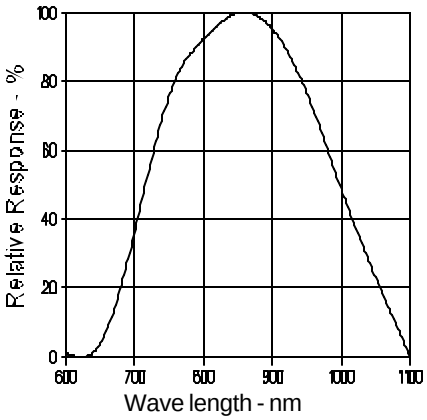
Absolute Maximum Ratings (T_A = 25° C unless otherwise noted)

Collector-Emitter Voltage . . . . . 30 V
Emitter Reverse Current . . . . . 10 mA
Continuous Collector Current . . . . . 50 mA
Storage and Operating Temperature Range . . . . . -40° 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 . . . . . 250 mW(2)

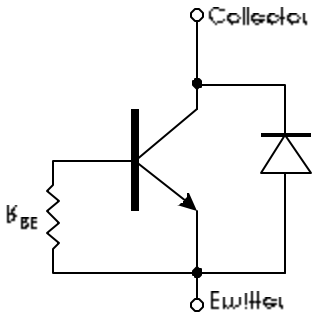
Notes:
(1) RMA flux is recommended. Duration can be extended to 10 sec. max. when flow soldering. Max. 20 grams force may be applied to leads when soldering.
(2) Derate linearly 3.33 mW/° C above 25° C.
(3) V_{CE} = 5 V. Light source is an unfiltered GaAlAs emitting diode operating at peak emission wavelength of 890 nm and $E_{e(APT)}$ of 1.7 mW/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 μA.

Typical Performance Curves

Typical Spectral Response



Schematic



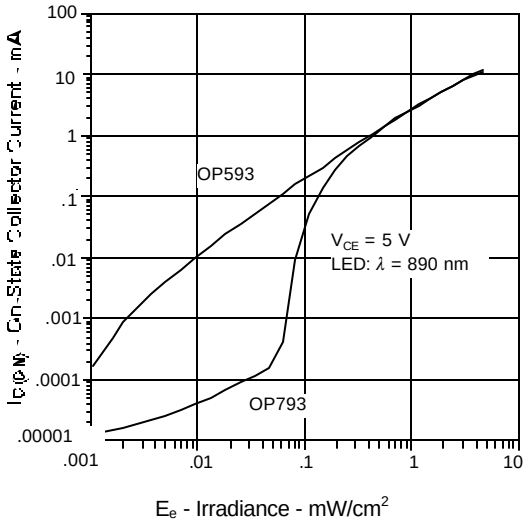
Types OP793, OP798 Series

Electrical Characteristics (T_A = 25°C unless otherwise noted)

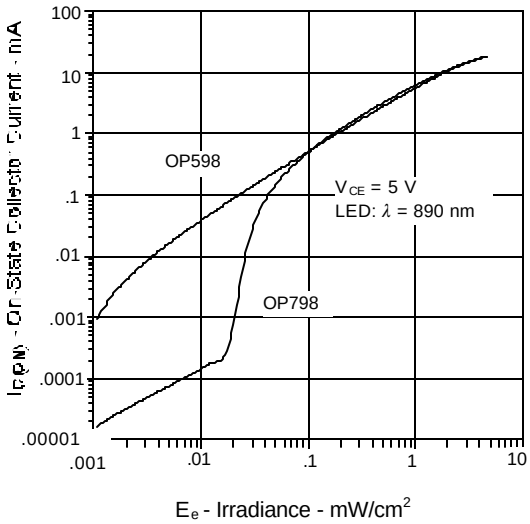
SYMBOL	PARAMETER		MIN	TYP	MAX	UNITS	TEST CONDITIONS
$I_{C(ON)}$	On-State Collector Current	OP793A	2.45		7.50	mA	V_{CE} = 5 V, E_e = 1.7 mW/cm^2 [3]
		OP793B	1.65		4.55		
		OP793C	0.90		3.05		
		OP793D	0.90		7.50		
$I_{C(ON)}$	On-State Collector Current	OP798A	4.90		15.0	mA	V_{CE} = 5 V, E_e = 1.7 mW/cm^2 [3]
		OP798B	3.30		9.20		
		OP798C	1.90		6.10		
		OP798D	1.90		15.0		
E_{KP}	Knee Point Irradiance	OP793		.10		mW/cm^2	V_{CE} = 5 V [4]
		OP798		.04			
I_{CEO}	Collector-Emitter Dark Current				100	nA	V_{CE} = 10 V, E_e = 0
I_{ECO}	Emitter-Reverse Current				100	µA	V_{CE} = 0.4 V
$V_{(BR)ECO}$	Collector-Emitter Breakdown Voltage		30			V	I_C = 100 µA
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage				0.4	V	I_C = 0.4 mA, E_e = 1.7 mW/cm^2 [3]

PHOTOSENSORS

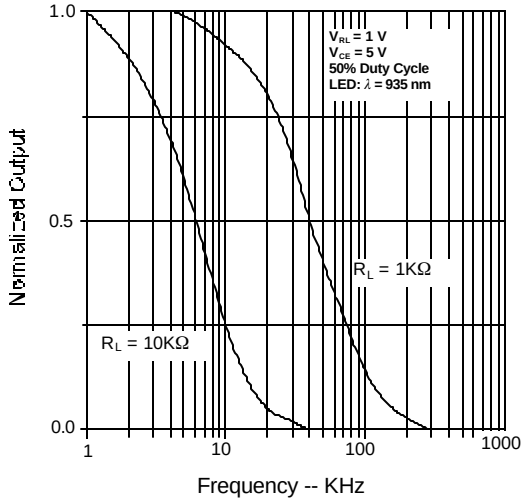
On-State Collector Current vs. Irradiance



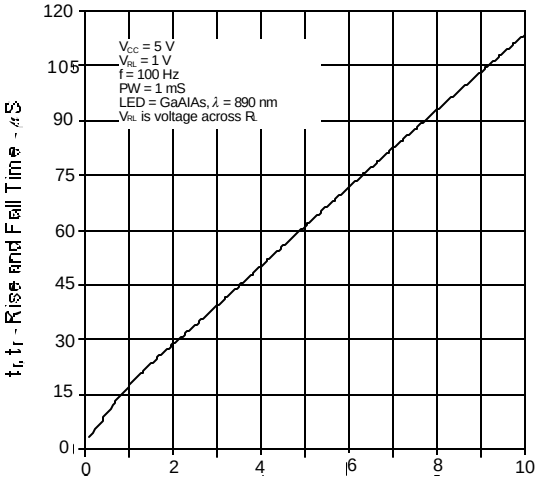
On-State Collector Current vs. Irradiance



Normalized Output vs. Frequency



Typical Rise and Fall Time vs. Load Resistance



Normalized Light and Dark Current vs. Ambient Temperature