NPN Plastic Silicon Phototransistor

OP593, OP598 Series

Features:

- Dark blue epoxy package
- Wide receiving angle
- Variety of sensitivity ranges
- TO-18 equivalent package style

Description:

Each device in this series consists of an NPN silicon phototransistor molded in a dark blue epoxy packages. The wide receiving angle (130°) of the **OP593** series devices provides relatively even reception over a large area. The narrow receiving angle (25°) of the **OP598** series devices provides a relatively small reception area.

These devices are 100% production tested using infrared light for close correlation with OPTEK's GaAs and GaAlAs emitters.

Please refer to Application Bulletin 210 for additional thermal design information.

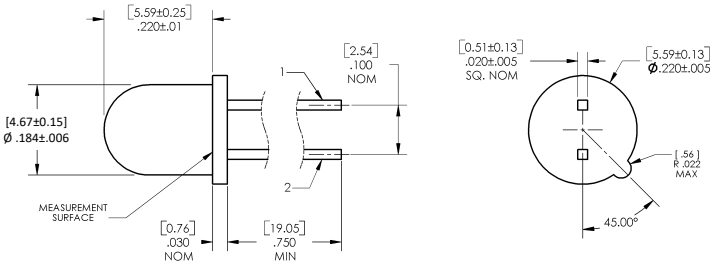
Applications:

- Non-contact reflective or slotted sensor
- Assembly line automation
- Machine automation
- Machine Safety
- End of travel sensor
- Door sensor
- Safety Curtain

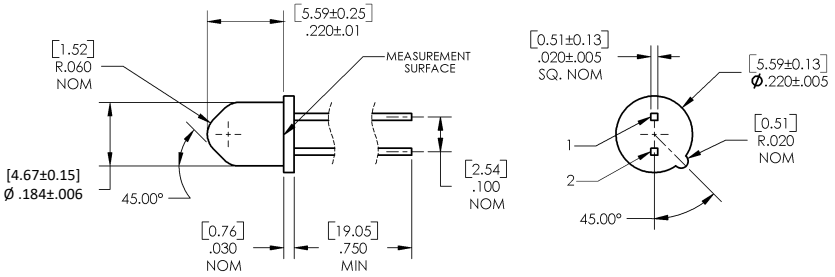
Pin #	Sensor
1	Collector
2	Emitter

Ordering Information			
Part Number	Sensor	Viewing Angle	Lead Length
OP593A	Transistor	130°	0.75"
OP593B			
OP598A		25°	
OP598B			
OP598C			

OP593



OP598



RoHS

DIMENSIONS ARE IN: [MILLIMETERS] INCHES

General Note

TT Electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

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Electrical Specifications

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

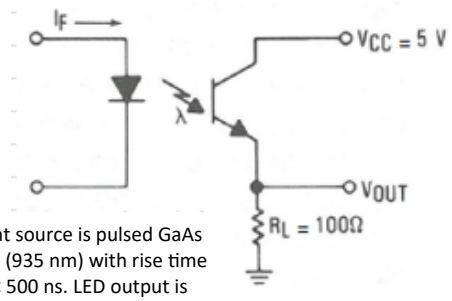
Storage and Operating Temperature Range	-40° C to +100° C
Collector-Emitter Voltage	30 V
Emitter-Collector Voltage	5 V
Continuous Collector Current	50 mA
Lead Soldering Temperature [1/16 inch (1.6 mm) from case for 5 seconds with soldering iron]	260° C(1)
Power Dissipation	250 mW(2)

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

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
$I_{C(ON)}$	On-State Collector Current OP593A OP593B OP598A OP598B OP598C	 3.0 2.0 7.5 5.0 2.5	 - - - - -	 4 4 10 10 10	mA	V_{CE} = 5 V. Light source is an unfiltered GaAlAs LED with a peak emission wavelength of 890 nm and $E_{e(APT)}$ of 1.7 mW/cm^2 average within a .250" diameter aperture.
I_{CEO}	Collector-Dark Current	-	-	100	nA	V_{CE} = 10 V, E_E = 0
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	30	-	-	V	I_C = 100 µA
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	5	-	-	V	I_E = 100 µA
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage	-	-	0.40	V	I_C = 0.4 mA, E_E = 1.7 mW/cm^2

Notes:
1. RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering. A maximum 20 grams force may be applied to the leads when soldering.
2. Derate linearly 3.00 mW/° C above 25° C.
3. To calculate typical collector dark current in µA, use the formula $I_{CEO}=10^{(0.040\,T_A\,-\,3.4)}$, where T_A is ambient temperature in ° C.

Test Circuit



Light source is pulsed GaAs LED (935 nm) with rise time of < 500 ns. LED output is adjusted until I_C = 0.8 mA.

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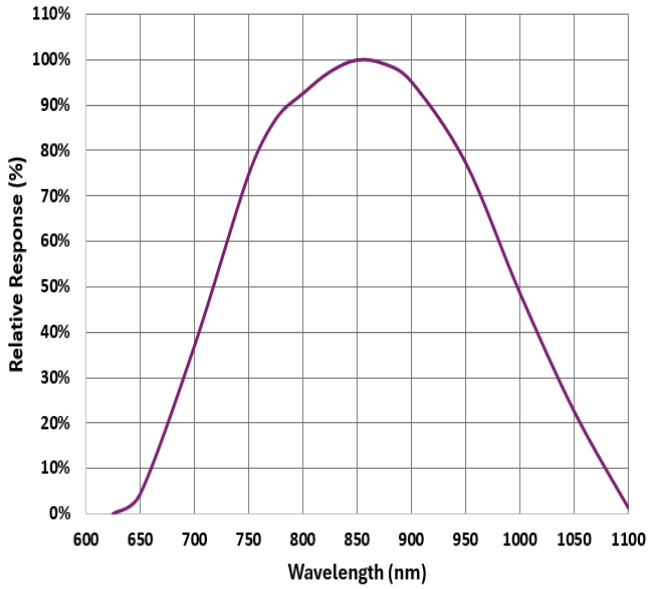
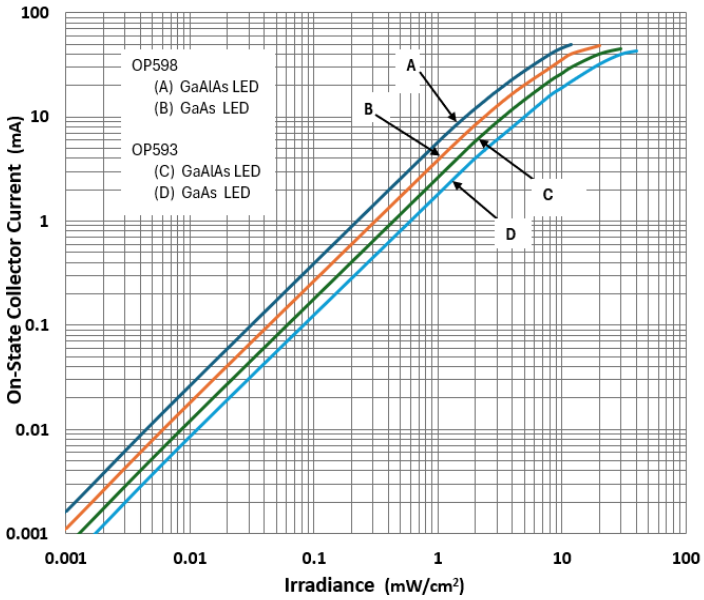
Performance

OP593, OP598

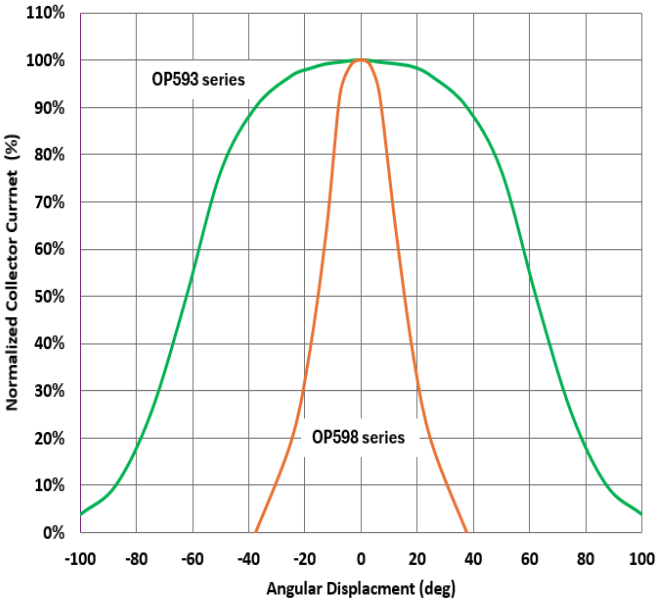
Typical Spectral Response



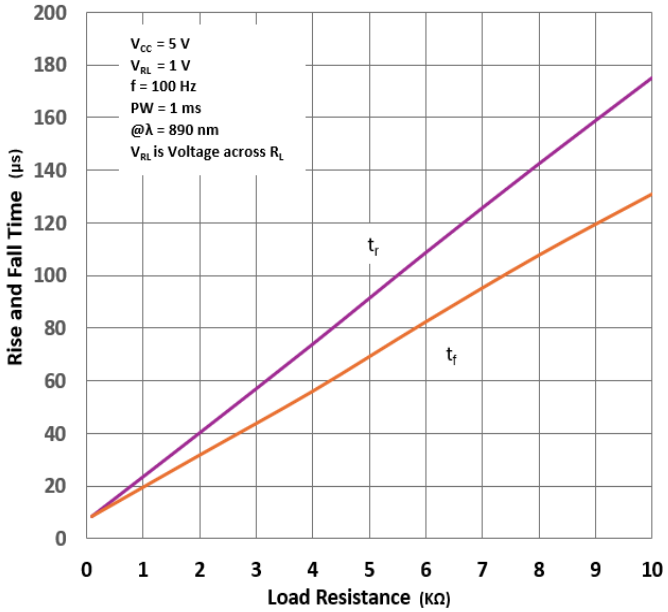
On-State Collector Current vs Irradiance



Normalized Collector Current vs Angular Displacement



Rise and Fall Times vs Load Resistance



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