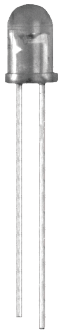
# NPN Silicon Phototransistor

## OP599 Series



### Features:

- Dark blue injection-molded plastic package
- Variety of sensitivity ranges
- T-1¾ package style with TO-18 base
- Excellent optical lens surface
- Excellent chip placement

### Description:

Each device in this series consists of a NPN silicon phototransistor mounted in a dark blue plastic injection molded shell package, with a narrow receiving angle that provides excellent on-axis coupling and optical/mechanical axis alignment. The shell also provides excellent optical lens surface, control of chip placement and consistency of the outside package dimensions.

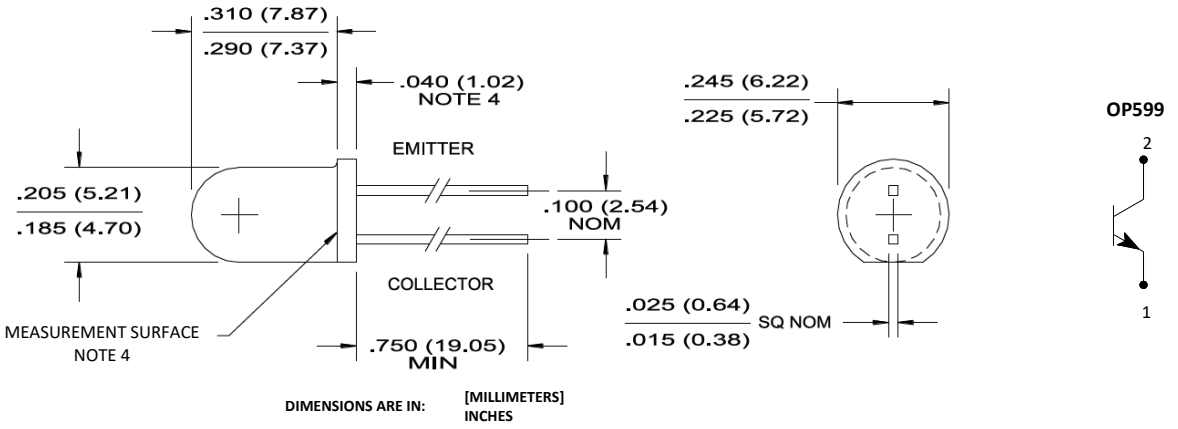
The **OP599** series sensors are 100% production tested for close correlation with OPTEK GaAlAs emitters.

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

### Applications:

- Applications requiring a narrow receiving angle
- Applications that are space-limited

| Ordering Information | | | |
|---|---|---|---|
| **Part Number** | **Sensor** | **Viewing Angle** | **Lead Length** |
| **OP599A** | Transistor | 20° | 0.75" |
| **OP599C** | | | |




RoHS

| Pin # | Sensor |
|---|---|
| 1 | Emitter |
| 2 | Collector |

**CONTAINS POLYSULFONE**

To avoid stress cracking, we suggest using ND Industries' **Vibra-Tite** for thread-locking. **Vibra-Tite** evaporates fast without causing structural failure in OPTEK'S molded plastics.



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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] (1) | 260° C |
| Power Dissipation (2) | 100 mW |

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

| SYMBOL | PARAMETER | MIN | TYP | MAX | UNITS | TEST CONDITIONS |
|---|---|---|---|---|---|---|
| $I_{C(ON)}$ (3) | On-State Collector Current<br>OP599A<br>OP599C | <br>2.35<br>0.40 | <br>-<br>- | <br>-<br>1.95 | mA | $V_{CE}$ = 5 V, $E_E$ = 0.25 mW/cm$^2$ |
| $I_{CEO}$ | Collector-Dark Current | - | - | 100 | nA | $V_{CE}$ = 10.0 V, $E_E$ = 0 |
| $V_{(BR)CEO}$ | Collector-Emitter Breakdown Voltage | 30 | - | - | V | $I_C$ = 100 µA |
| $V_{(BR)ECO}$ | Emitter-Collector Breakdown Voltage | 5.0 | - | - | V | $I_E$ = 100 µA |
| $V_{CE(SAT)}$ (3) | Collector-Emitter Saturation Voltage | - | - | 0.40 | V | $I_C$ = 100 µA, $E_E$ = 0.25 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 1.07 mW/° C above 25° C.
3. Light source is an unfiltered GaAlAs emitting diode operating at peak emission wavelength of 890 nm.
4. This dimension is held to within ±0.005” on the flange edge and may vary up to ±0.020” in the area of the leads.




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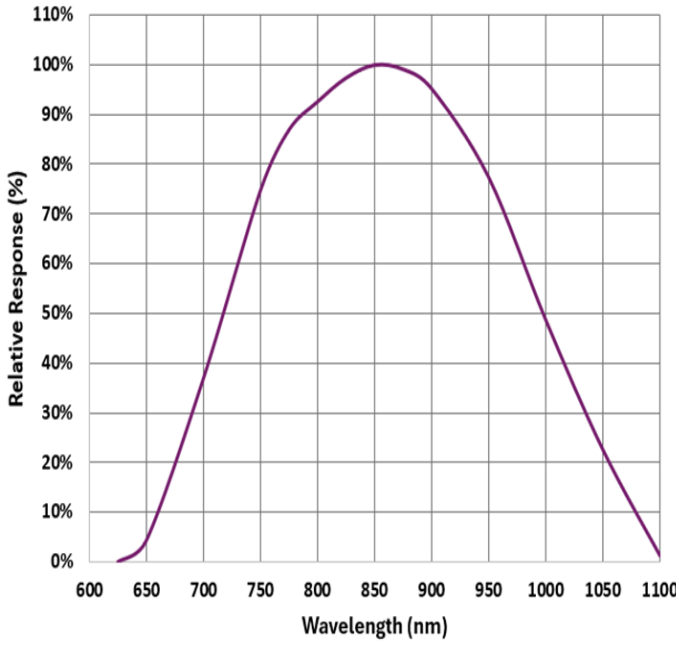
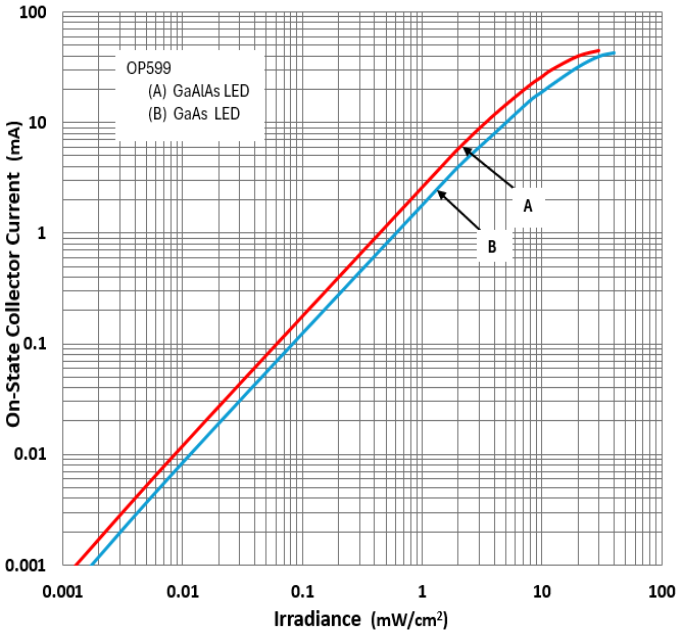
## Typical Performance

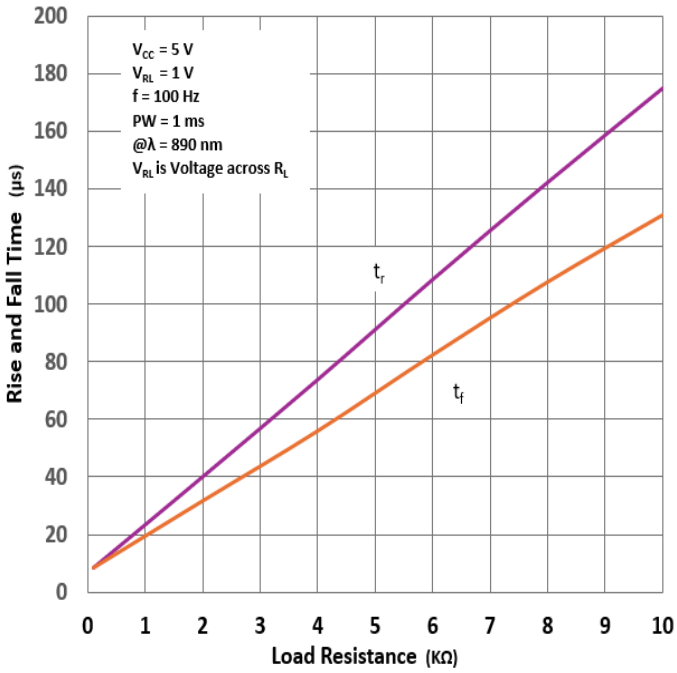
### Typical Spectral Response



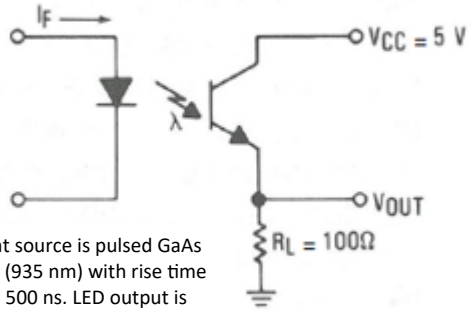

### On-State Collector Current vs Irradiance




### Rise and Fall Times vs Load Resistance




### 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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