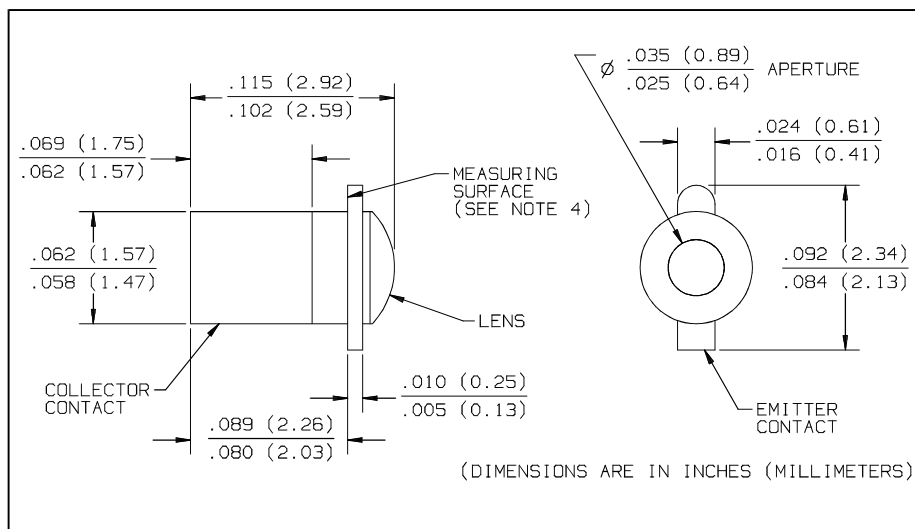


# Hi-Reliability NPN Silicon Phototransistors

## Types OP602TX/V, OP603TX/V, OP604TX/V, OP604S



### Features

- Processed to Optek's military screening program patterned after MIL-PRF-19500
- Miniature hermetically sealed package
- Wide range of collector currents
- Ideal for direct mounting in PC boards

### Description

Each device in this series consists of a high reliability NPN silicon phototransistor mounted in a miniature glass lensed, hermetically sealed, "Pill" package.

After electrical testing by manufacturing, all devices are processed to Optek's 100% screening program patterned after MIL-PRF-19500. Typical screening and lot acceptance tests are provided on page 13-4.

This device type is lensed and has an acceptance half angle of 18° measured from the optical axis to the half power point. The series is also mechanically and spectrally matched to the OP223 and OP224 high reliability series of infrared emitting diodes.

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

|                                                           |                       |
|-----------------------------------------------------------|-----------------------|
| Storage Temperature Range                                 | -65° C to +150° C     |
| Operating Temperature Range                               | -55° C to +125° C     |
| Collector-Emitter Voltage                                 | 50 V                  |
| Emitter-Collector Voltage                                 | 7.0 V                 |
| Soldering Temperature (for 5 seconds with soldering iron) | 240° C <sup>(1)</sup> |
| Power Dissipation                                         | 50 mW <sup>(2)</sup>  |

#### Notes:

- (1) No-clean or low solids, RMA flux is recommended. Duration can be extended to 10 sec. max. when wave soldering.
- (2) Derate linearly 0.5 mW/° C above 25° C.
- (3) Junction temperature maintained at 25° C.
- (4) Light source is an unfiltered tungsten lamp operating at CT = 2870 K or equivalent source.

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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           |     |     |           |                     |                                                                                                    |
|               | OP602TX, TXV                         | 2.0 |     | 5.0       | mA                  | $V_{CE} = 5.0 \text{ V}, E_e = 20 \text{ mW/cm}^{2(3)(4)}$                                         |
|               | OP603TX, TXV                         | 4.0 |     | 8.0       | mA                  | $V_{CE} = 5.0 \text{ V}, E_e = 20 \text{ mW/cm}^{2(3)(4)}$                                         |
|               | OP604TX, TXV, S                      | 7.0 |     |           | mA                  | $V_{CE} = 5.0 \text{ V}, E_e = 20 \text{ mW/cm}^{2(3)(4)}$                                         |
| $I_{CEO}$     | Collector Dark Current               |     |     | 25<br>100 | nA<br>$\mu\text{A}$ | $V_{CE} = 10.0 \text{ V}, E_e = 0$<br>$V_{CE} = 30.0 \text{ V}, E_e = 0, T_A = 100^\circ \text{C}$ |
| $V_{(BR)CEO}$ | Collector-Emitter Breakdown Voltage  | 50  |     |           | V                   | $I_C = 100 \mu\text{A}, E_e = 0$                                                                   |
| $V_{(BR)ECO}$ | Emitter-Collector Breakdown Voltage  | 7.0 |     |           | V                   | $I_E = 100 \mu\text{A}, E_e = 0$                                                                   |
| $V_{CE(SAT)}$ | Collector-Emitter Saturation Voltage |     |     | 0.40      | V                   | $I_C = 0.4 \text{ mA}, E_e = 20 \text{ mW/cm}^{2(3)(4)}$                                           |
| $t_r$         | Rise Time                            |     |     | 20.0      | $\mu\text{s}$       | $V_{CC} = 30 \text{ V}, I_C = 1.00 \text{ mA},$<br>$R_L = 100 \Omega$                              |
| $t_f$         | Fall Time                            |     |     | 20.0      | $\mu\text{s}$       |                                                                                                    |

HI-RELOPTO  
COMPONENTS

Optek 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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