

High Reliability NPN Silicon Phototransistor

OP602, OP603, OP604 (TX, TXV)

OP604 (S)



Features:

- Miniature hermetically sealed package
- Wide range of collector currents
- Ideal for direct mounting to PCBoard
- TX, TXV & S devices are processed to MIL-PRF-19500

Description:

Each device in the **OP600** high reliability series consists of a high-reliability NPN silicon phototransistor that is mounted in a glass-lensed miniature hermetically sealed “pill” package with an 18° half angle, as measured from the optical axis to the half-power point.

After electrical testing by manufacturing, devices are processed to OPTEK’s 100 percent screening program, which is patterned after MIL-PRF-19500. *Components in the high reliability OP600 series are mechanically and spectrally matched to the OP223 and OP224 high reliability series of infrared emitting diodes.*

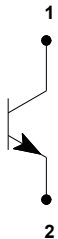
TX, TXV and S devices are processed to OPTEK’s military screening program patterned after MIL-PRF-19500.

Please refer to Application Bulletins 208 and 210 for additional design information and reliability (degradation) and to Application Bulletin OP202 for pill-type soldering to PCBoard.

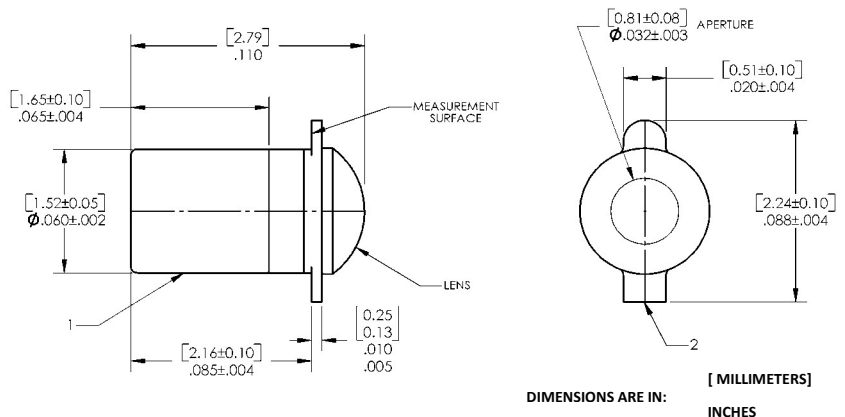
Applications:

- Non-contact reflective object sensor
- Assembly line automation
- Machine automation
- Machine safety
- End of travel sensor

Part Number	Light Current $I_{C(ON)}$ (mA) Min / Max	V_{CE} Typ / Max	Input Power E_E (mW/cm ²)	Viewing Angle
OP602TX	2.00 / 5.00	5 / 50	20.0	35°
OP602TXV				
OP603TX	4.00 / 8.00			
OP603TXV				
OP604S	7.00 / NA			
OP604TX				
OP604TXV				



Pin #	Sensor
1	Collector/Cathode
2	Emitter/Anode



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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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 (5 seconds with soldering iron) ⁽¹⁾	260° C
Power Dissipation ⁽²⁾	50 mW

Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Input Diode

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
$I_{C(ON)}$	On-State Collector Current					$V_{CE} = 5.0\text{ V}, E_E = 20\text{ mW/cm}^{2(3)(4)}$
	OP602TX, OP602TXV	2	-	5	mA	
	OP603TX, OP603TXV	4	-	8		
	OP604TX, OP604TXV, OP604S	7	-	-		
I_{CEO}	Collector Dark Current	-	-	25	nA	$V_{CE} = 10.0\text{ V}, E_E = 0$
		-	-	100	μA	$V_{CE} = 30.0\text{ V}, E_E = 0, T_A = 100^\circ\text{ C}$
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	50	-	-	V	$I_C = 100\ \mu\text{A}, E_E = 0$
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	7	-	-	V	$I_C = 100\ \mu\text{A}, E_E = 0$
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage	-	-	0.4	V	$I_C = 0.4\text{ mA}, E_E = 20\text{ mW/cm}^{2(3)(4)}$
t_f	Rise Time	-	-	20	μs	$V_{CC} = 30\text{ V}, I_C = 1.00\text{ mA},$ $RL = 100\ \Omega^{(2)(3)(4)}$
t_r	Fall Time	-	-	20		

Notes:

- (1) Refer to Application Bulletin 202, which discusses proper techniques for soldering pill-type devices to PCBs.
- (2) No clean or low solids. RMA flux is recommended. Duration can be extended to 10 seconds maximum when wave soldering.
- (3) Derate linearly 0.5 mW/° C above 25° C.
- (4) Junction temperature maintained at 25° C.
- (5) Light source is an unfiltered tungsten lamp operating at $CT=2870\text{ K}$ or equivalent source.

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