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.*

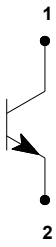
TX, TXV and S devices are processed to OPTEK's military screening program patterned after MIL-PRF-19500.

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.

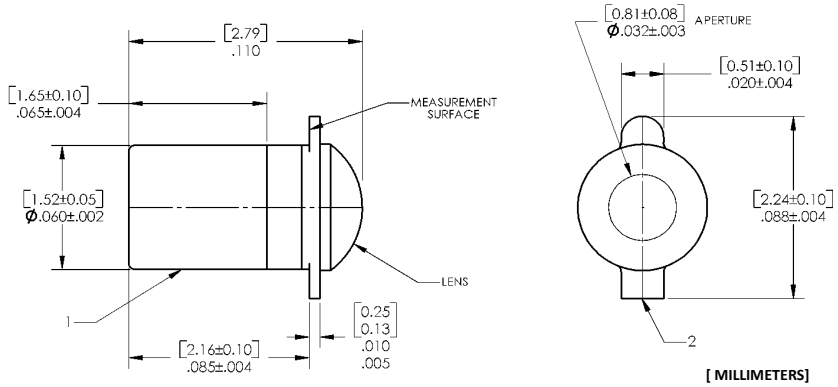
Applications:

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



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

Input Diode

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

Notes:

(1) Refer to Application Bulleting 202, which discusses proper techniques for soldering pill-type devices to PCBoards.
(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 K or equivalent source.

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