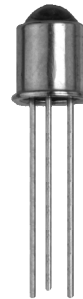


High Reliability NPN Silicon Phototransistor

OP804, OP805 (TX, TXV)



Features:

- TO-18 hermetically sealed package
- Lensed for high sensitivity
- Narrow acceptance angle
- Processed after MIL-PRF-19500
- Mechanically and spectrally matched to high reliability IREDs in the OP235 and OP236 series

Description:

Each device in this series consists of a high reliability NPN silicon phototransistor mounted in a hermetically sealed TO-18 package, which offers high power dissipation and superior hostile environment operation. Device lensing creates a $\pm 12^\circ$ angle when measured from the optical axis to the half power point.

These devices can be matched with a solid state infrared source (such as the high resolution OP235 and OP236 series of IREDs), or can be used to sense infrared content in a visible light source (such as a tungsten bulb or sunlight) for automatic brightness control.

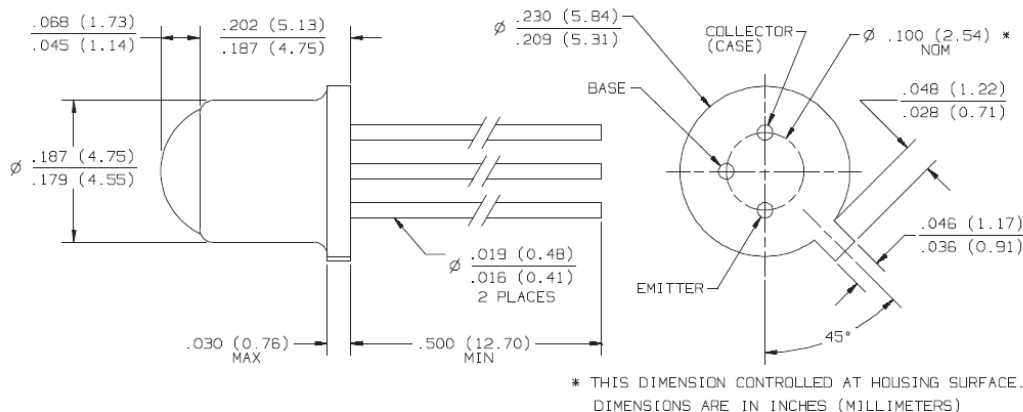
TX and TXV devices are processed to MIL-PRF-19500.

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

Applications:

- Space-limited applications
- Hostile environment applications
- High reliability applications

Ordering Information										
Part Number	Sensor	Light Current I _{C(ON)} (mA) Min / Max	V _{CE} (V) Typ/Max	Input Power E _E (mW/cm ²)	Viewing Angle	Lead Length				
OP804TX	Transistor	7.00 / 22.00	5/30	5.0	25°	0.50"				
OP804TXV										
OP805TX		15.00 / NA								
OP805TXV										



General Note

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Electrical Specifications

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-Base Voltage	30 V
Collector-Emitter Voltage	30 V
Emitter-Base Voltage	5 V
Emitter-Collector Voltage (applies to all OP800 and OP830 devices)	5 V
Lead Soldering Temperature [1/16 inch (1.6 mm) from case for 5 seconds with soldering iron] ⁽¹⁾	260° C
Power Dissipation ⁽²⁾	250 mW

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

Input Diode						
SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
$I_{C(ON)}$ ⁽³⁾	On-State Collector Current OP804 (TX, TXV) OP805 (TX, TXV)	7.0 15.0	-	8 22	mA	$V_{CE} = 5.0\text{ V}$, $E_e = 20\text{ mW/cm}^2$
I_{CEO}	Collector-Emitter Dark Current	-	-	100	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-Base Breakdown Voltage	30	-	-	V	$I_C = 100\text{ }\mu\text{A}$, $I_B = 0$, $E_e = 0$
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	7.0	-	-	V	$I_C = 100\text{ }\mu\text{A}$, $E_e = 0$
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage	-	-	0.40	V	$I_C = 0.4\text{ mA}$, $E_e = 20\text{ mW/cm}^2$
t_r	Rise Time OP804 (TX, TXV) OP805 (TX, TXV)	-	-	10.0 15.0	μs	$V_{CC} = 30\text{ V}$, $I_C = 1.00\text{ mA}$, $R_L = 100\text{ }\Omega$
t_f	Fall Time OP804 (TX, TXV) OP805 (TX, TXV)	-	-	10.0 15.0		

Notes:

- (1) RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering.
- (2) Derate linearly 2.30 mW/° C above 25° C.
- (3) Light source is an unfiltered tungsten lamp operated at a temperature of 2870 K.

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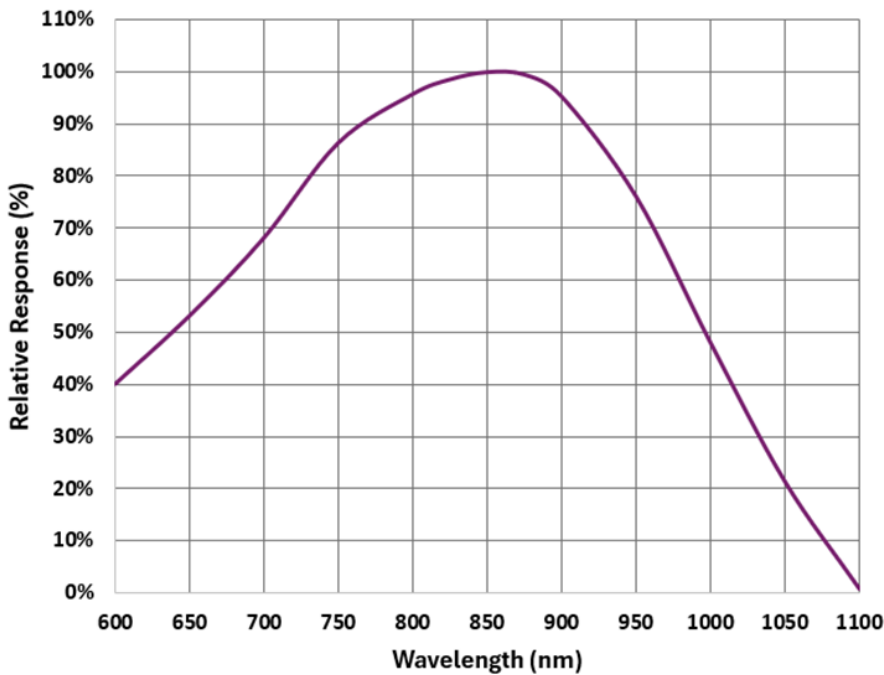
High Reliability NPN Silicon Phototransistor

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Typical Performance

Typical Spectral Response



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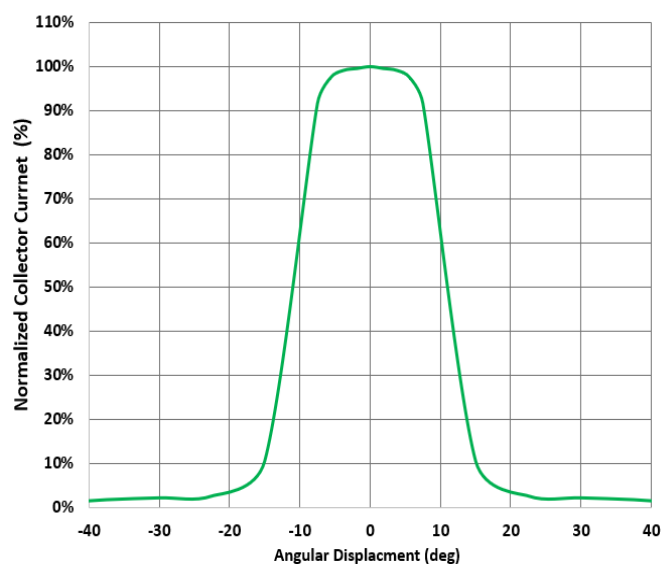
High Reliability NPN Silicon Phototransistor

OP804, OP805 (TX, TXV)

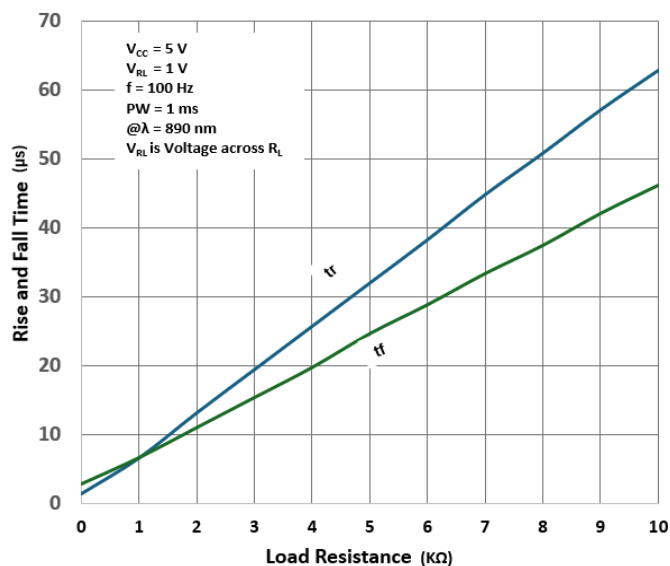


Typical Performance

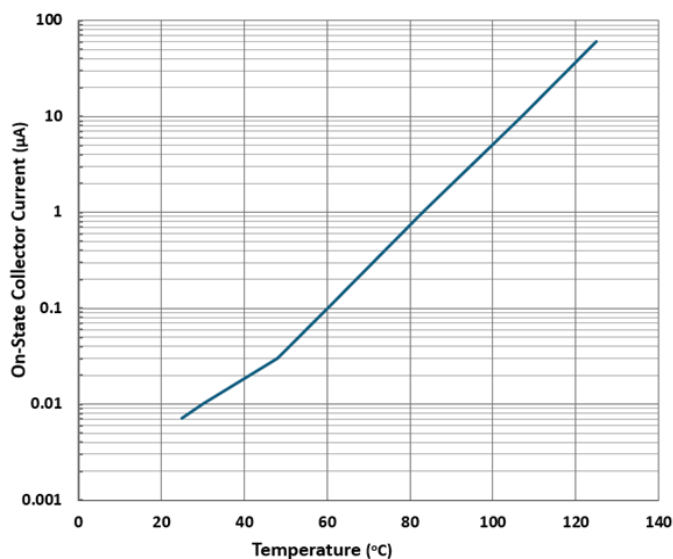
Normalized Collector Current vs Angular Displacement



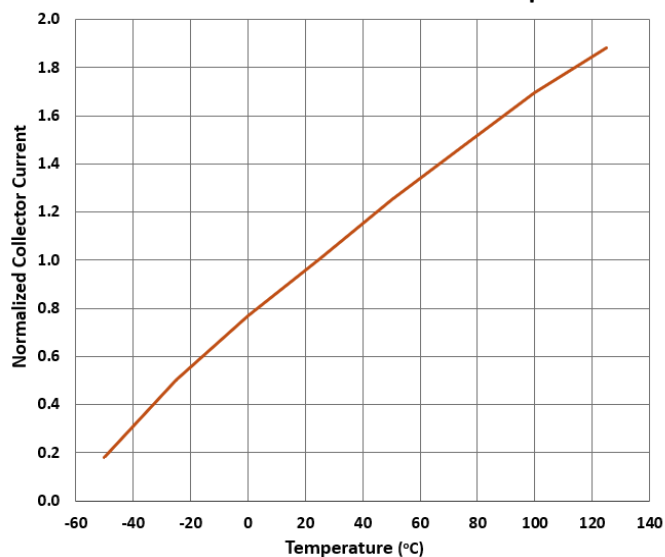
Rise and Fall Times vs Load Resistance



Collector Dark Current vs Temperature



Normalized Collector Current vs Temperature



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