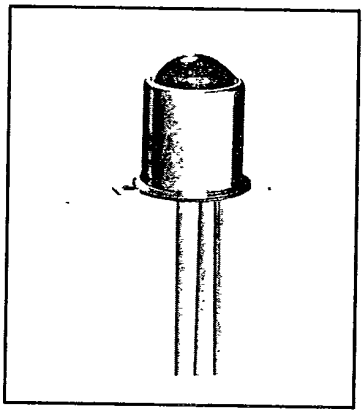
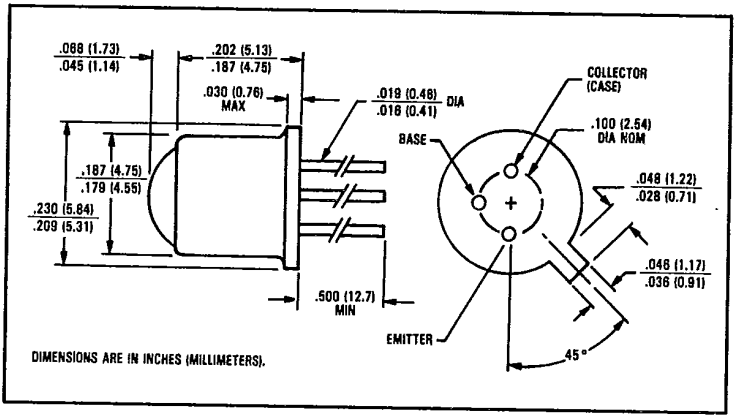
NPN Silicon Phototransistors
Types OP800, OP801, OP802, OP803, OP804, OP805





Features
- Lensed for high sensitivity
- Wide range of collector currents
- TO-18 hermetically sealed package

Description
The OP800 through OP805 each consist of an NPN silicon phototransistor mounted in a lensed, hermetically sealed, TO-18 package. TO-18 packages offer high power dissipation, and superior hostile environment operation. The lensing effect allows an acceptance half angle of 10° measured from the optical axis to the half power point. The base lead is bonded to enable conventional transistor biasing. This series is mechanically and spectrally matched to the OP130 and OP231 series of infrared emitting diodes.

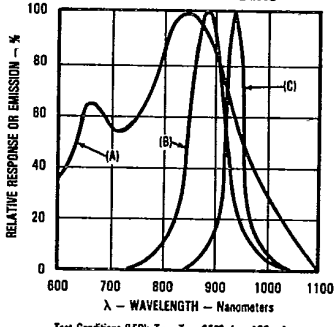
Absolute Maximum Ratings (T_A = 25°C unless otherwise noted)

Collector-Base Voltage	30 V
Collector-Emitter Voltage	30 V
Emitter-Base Voltage	5.0 V
Emitter-Collector Voltage	5.0 V
Storage Temperature Range	−65°C to +150°C
Operating Temperature Range	−65°C to +125°C
Lead Soldering Temperature (1/16 inch [1.6 mm] from case for 5 sec. with soldering iron)[1]	240°C
Power Dissipation	250 mW[2]

Notes:
(1) RMA flux is recommended. Duration can be extended to 10 sec. max. when wave soldering.
(2) Derate linearly 2.5 mW/°C above 25°C.
(3) Junction temperature maintained at 25°C.
(4) Light source is an unfiltered tungsten bulb operating at CT = 2870°K or equivalent infrared source.

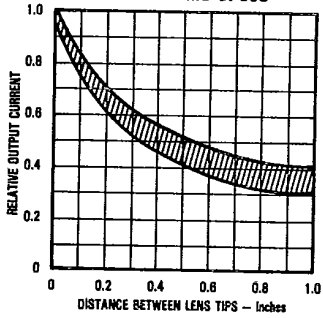
Typical Performance Curves

Spectral Response of OP800-OP805 vs. GaAlAs and GaAs



Test Conditions (LED): $T_A = T_J = 25°C$, $I_F = 100$ mA, DC = 0.1%, PW = 100 µs
Peak Wavelength – λp: (A) XSTR – 850 ± 30 nm, (B) LED GaAlAs – 875 ± 20 nm, (C) LED GaAs – 930 ± 15 nm

Coupling Characteristics of OP130 and OP800

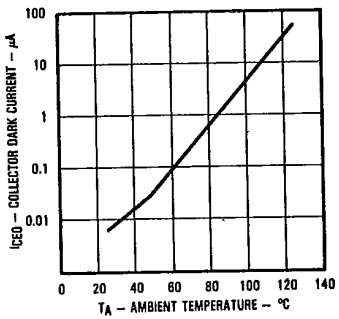


Electrical Characteristics (T_A = 25°C unless otherwise noted)

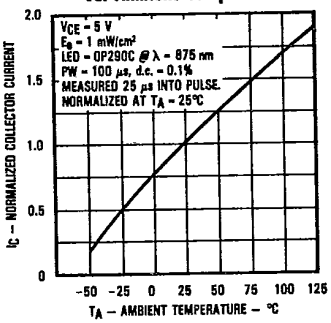
Symbol	Parameter		Min.	Typ.	Max.	Units	Test Conditions
$I_{C(ON)}$[3]	On-State Collector Current	OP800	0.50			mA	V_{CE} = 5.0 V, E_e = 5.0 mW/cm²[4]
		OP801	0.50		3.0	mA	V_{CE} = 5.0 V, E_e = 5.0 mW/cm²[4]
		OP802	2.0		5.0	mA	V_{CE} = 5.0 V, E_e = 5.0 mW/cm²[4]
		OP803	4.0		8.0	mA	V_{CE} = 5.0 V, E_e = 5.0 mW/cm²[4]
		OP804	7.0		22	mA	V_{CE} = 5.0 V, E_e = 5.0 mW/cm²[4]
		OP805	15.0			mA	V_{CE} = 5.0 V, E_e = 5.0 mW/cm²[4]
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
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage				0.4	V	I_C = 0.40 mA, E_e = 5.0 mW/cm²[4]
t_r	Rise Time			2.0		μs	V_{CC} = 5.0 V, I_C = 0.80 mA
t_f	Fall Time			2.0		μs	R_L = 100Ω, See Test Circuit

Typical Performance Curves

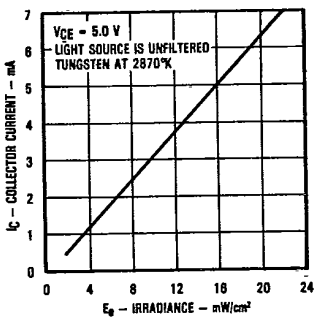
Collector Dark Current vs. Ambient Temperature



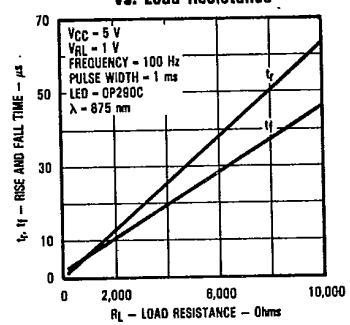
Normalized Collector Current vs. Ambient Temperature



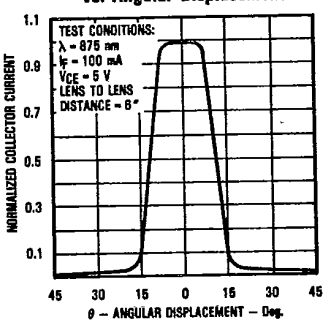
Collector Current vs. Irradiance



Rise and Fall Time vs. Load Resistance



Normalized Collector Current vs. Angular Displacement



Switching Time Test Circuit