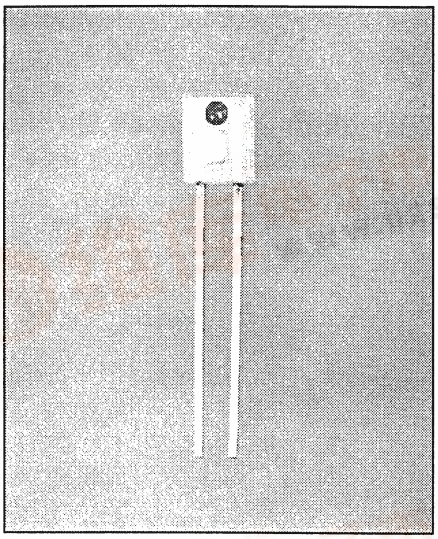
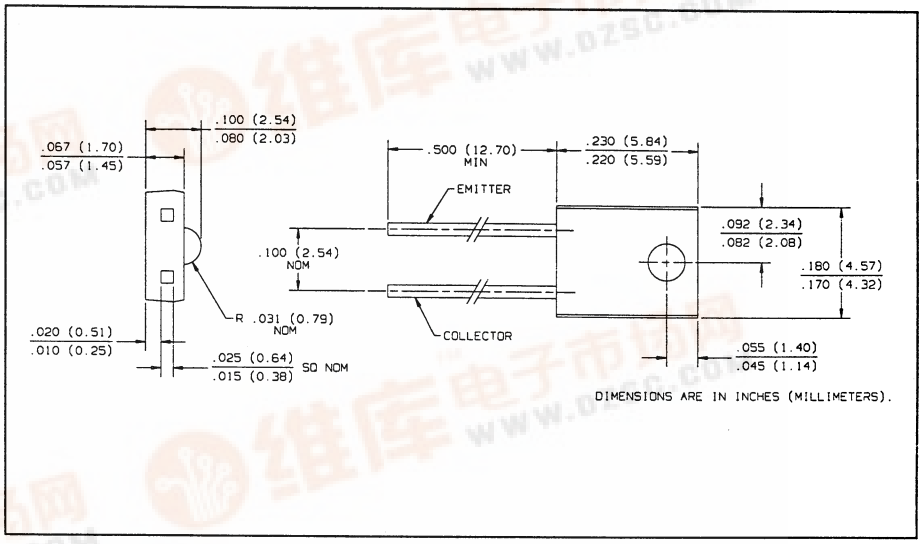
Product Bulletin OP560A
June 1996

NPN Silicon Photodarlington
Types OP560A, OP560B, OP560C





Features

- Variety of sensitivity ranges
- High current gain
- Side-looking package for space limited applications

Description

The OP560 series consists of NPN silicon photodarlingtons molded in clear epoxy packages. The lensing effect allows an acceptance half angle of 28° measured from the optical axis to the half power point. Photodarlington devices are normally used in applications where light signal levels are low and more current gain is needed than is possible with phototransistors. The side-looking package is designed for easy PC board mounting of slotted optical switches or optical interrupt detectors. These devices are 100% production tested using infrared light for close correlation with Optek GaAs and GaAlAs emitters.

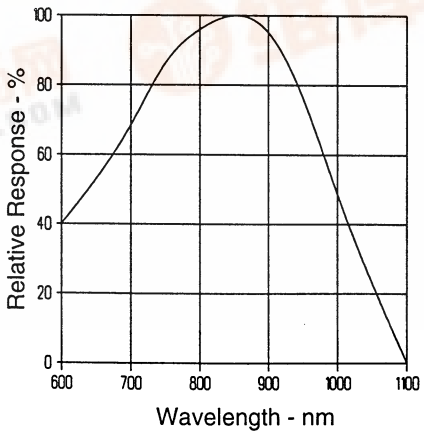
Absolute Maximum Ratings (T_A = 25° C unless otherwise noted)

Collector-Emitter Voltage	15.0 V
Emitter-Collector Voltage	5.0 V
Storage and Operating Temperature Range	-40° C to +100° C
Lead Soldering Temperature [1/16 inch (1.6 mm) from case for 5 sec. with soldering iron]	260° C(1)
Power Dissipation	100 mW(2)

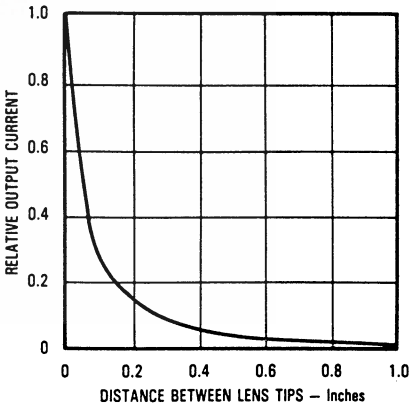
Notes:
(1) RMA flux is recommended. Duration can be extended to 10 sec. max. when flow soldering. Max. 20 grams force may be applied to leads when soldering.
(2) Derate linearly 1.33 mW/° C above 25° C.
(3) Light source is an unfiltered GaAs LED with a peak emission wavelength of 935 nm and a radiometric intensity level which varies less than 10% over the entire lens surface of the phototransistor being tested.

Typical Performance Curves

Typical Spectral Response



Coupling Characteristics of OP140__ and OP560



Types OP560A, OP560B, OP560C

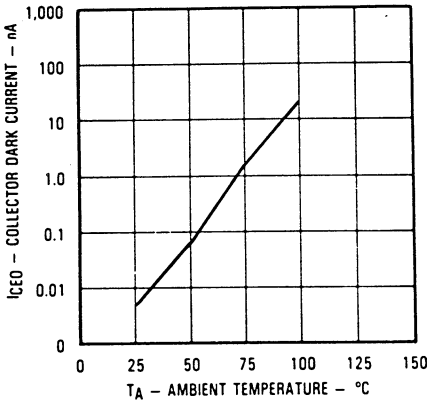
Electrical Characteristics (T_A = 25° C unless otherwise noted)

SYMBOL	PARAMETER		MIN	TYP	MAX	UNITS	TEST CONDITIONS
$I_{C(ON)}$	On-State Collector Current	OP560C	1.1			mA	V_{CE} = 2 V, E_e = 0.1 mW/cm$^{2(3)}$
		OP560B	3.3		9.8	mA	
		OP560A	6.6			mA	
I_{CEO}	Collector Dark Current				100	nA	V_{CE} = 10 V, E_e = 0
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage		15			V	I_C = 1 mA, E_e = 0
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage		5			V	I_E = 100 µA, E_e = 0
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage				1.10	V	I_C = 0.4 mA, E_e = 0.1 mW/cm$^{2(3)}$

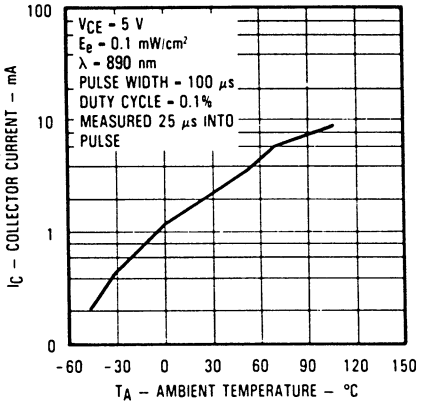
PHOTOSENSORS

Typical Performance Curves

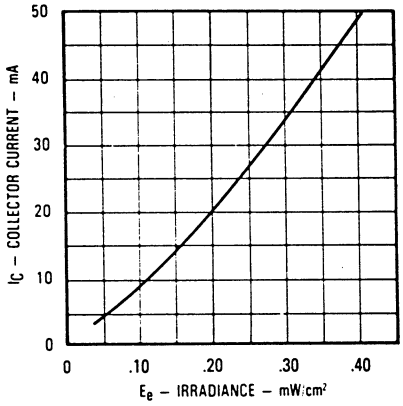
Collector Dark Current vs. Ambient Temperature



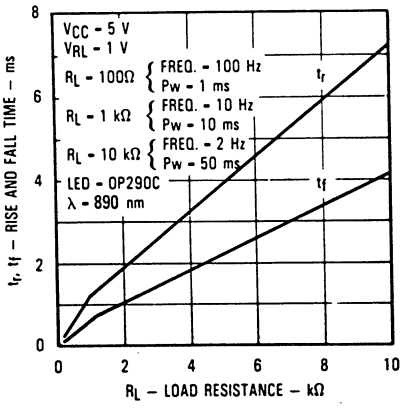
Collector Current vs. Ambient Temperature



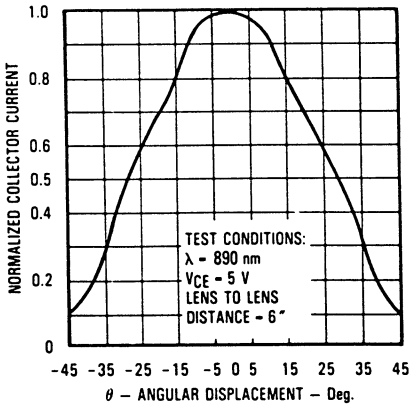
Collector Current vs. Irradiance



Rise and Fall Time vs. Load Resistance



Normalized Collector Current vs. Angular Displacement



Switching Time Test Circuit