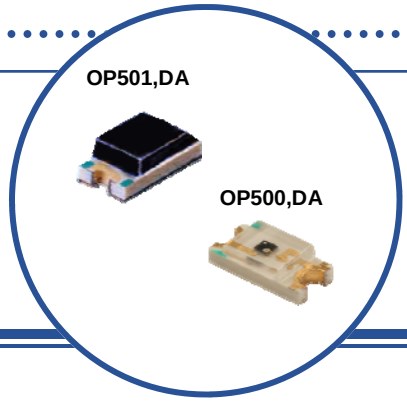
Silicon Phototransistor and Photo Darlington in Miniature 0805 SMD Package

OP500, OP501, OP500DA, OP501DA

TT electronics
OPTEK Technology

Features:

- High photo sensitivity
- Fast response time
- 0805 package size
- Phototransistor or Photo Darlington Output
- Choice of opaque or water clear flat lens



Description:

Each of these devices consists of a NPN silicon phototransistor mounted in a miniature SMT package with a 0805 size chip carrier that is compatible with most automated mounting and position sensing equipment.

Both **OP500, OP500DA** and **OP501, OP501DA** have a flat lens. **OP501** and **OP501DA** has an opaque lens that shields the device from stray light, whereas **OP500** and **OP500DA** has a water clear lens. All devices have a wide viewing acceptance angle and higher collector current than devices without lenses especially on the **OP500DA** and **OP501** which incorporate photo darlington die instead on the standard transistor.

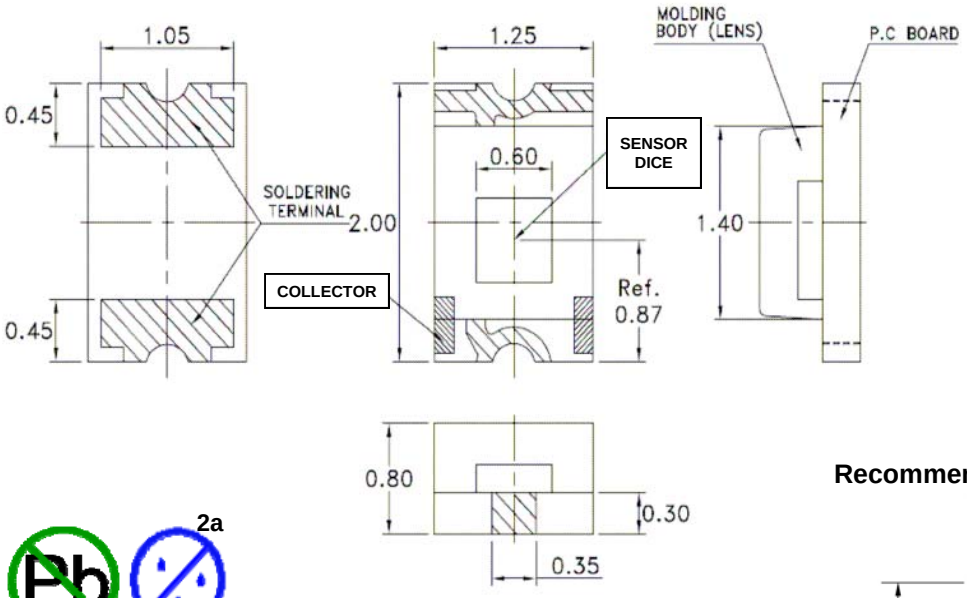
OP500, **OP501**, **OP500DA** and **OP501DA** *are mechanically and spectrally matched to the OP200 series infrared LEDs.*

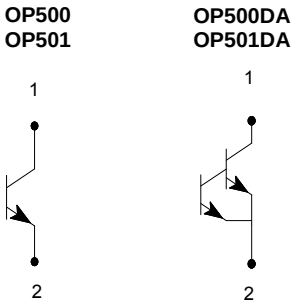
Applications:

- Non-contact position sensing
- Datum detection
- Machine automation
- Optical encoders

Ordering Information			
Part Number	**Sensor**	**Viewing Angle**	**Lead Length**
OP500	Phototransistor	150°	N/A
OP501			
OP500DA	Photo Darlington	150°	
OP501DA			

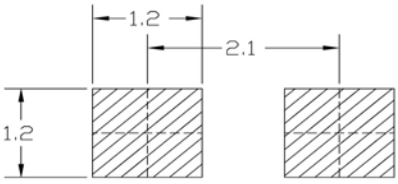
OP500, OP501, OP500DA, OP501DA





Pin #	Transistor
1	Collector
2	Emitter

Recommended Solder Pad Patterns



2a

RoHS Moisture

OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.

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

Storage Temperature Range	-40° C to +100° C
Operating Temperature Range	-25° C to +85° C
Lead Soldering Temperature[1]	260° C
Collector-Emitter Voltage OP500, OP501 OP500DA, OP501DA	 30 V 35 V
Emitter-Collector Voltage	5 V
Collector Current OP500, OP501 OP500DA, OP501DA	 20 mA 32 mA
Power Dissipation[2] OP500, OP501 OP500DA, OP501DA	 75 mW 100 mW

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

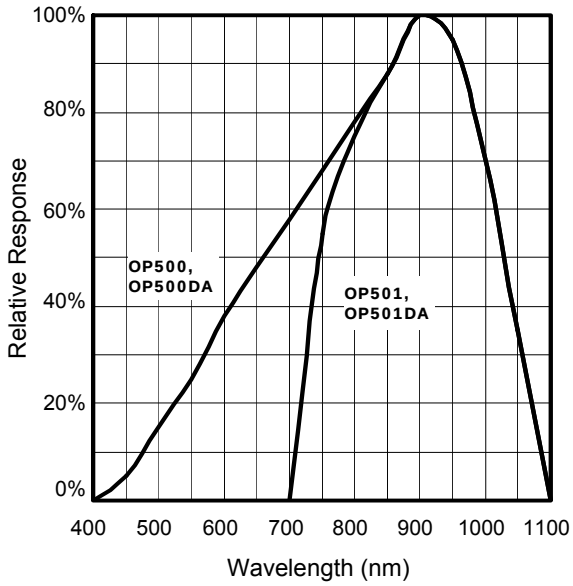
SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Diode						
$I_{C(ON)}$	On-State Collector Current OP500, OP501 OP500DA, OP501DA	 0.1 10.0	 - -	 - -	mA	 V_{CE} = 5.0 V, E_E = 0.15 mW/cm^2 [3] V_{CE} = 5.0 V, E_E = 0.15 mW/cm^2 [3]
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage OP500, OP501 OP500DA, OP501DA	 - -	 - -	 0.3 1.0	V	 I_C = 100 µA, E_E = 1.0 mW/cm^2 [3] I_C = 1 mA, E_E = 0.15 mW/cm^2 [3]
I_{CEO}	Collector-Emitter Dark Current	-	-	100	nA	V_{CC}= 5.0 V [4]
$V_{BR(CEO)}$	Collector-Emitter Breakdown Voltage OP500, OP501 OP500DA, OP501DA	 30 35	 -	 -	V	 I_C= 100 µA, E_E = 0
$V_{BR(ECO)}$	Emitter-Collector Breakdown Voltage OP500, OP501 OP500DA, OP501DA	 5 5	 - -	 - -	V	 I_E= 100 µA, E_E = 0 I_C= 100 µA, E_E = 0
t_r, t_f	Rise and Fall Times OP500, OP501 OP500DA, OP501DA	 -	 15 50	 - 60	µs	 I_C= 1 mA, R_L = 1KΩ I_C= 1 mA, R_L = 1KΩ

Notes:
1. Solder time less than 5 seconds at temperature extreme.
2. Derate linearly at 2.17 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.
4. To calculate typical collector dark current in µA, use the formulate $I_{CEO} = 10^{(0.04\,t\,-\,¾)}$, where T_A is the ambient temperature in ° C.

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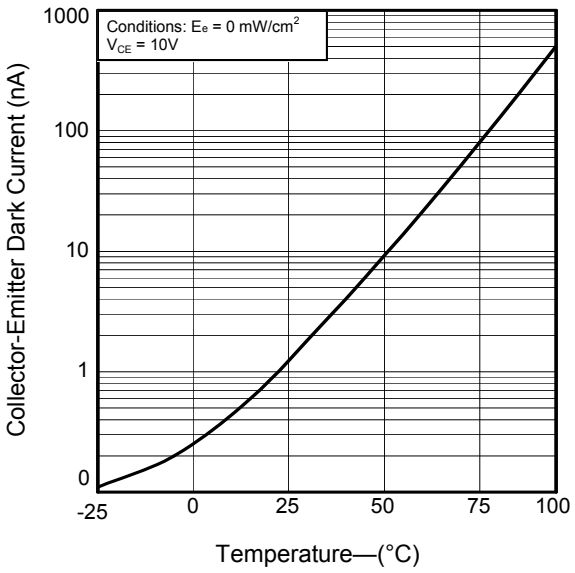
OPTEK Technology Inc. — 1645 Wallace Drive, Carrollton, Texas 75006
Phone: (972) 323-2200 or (800) 341-4747 FAX: (972) 323-2396 sensors@optekinc.com www.optekinc.com

Relative Response vs. Wavelength

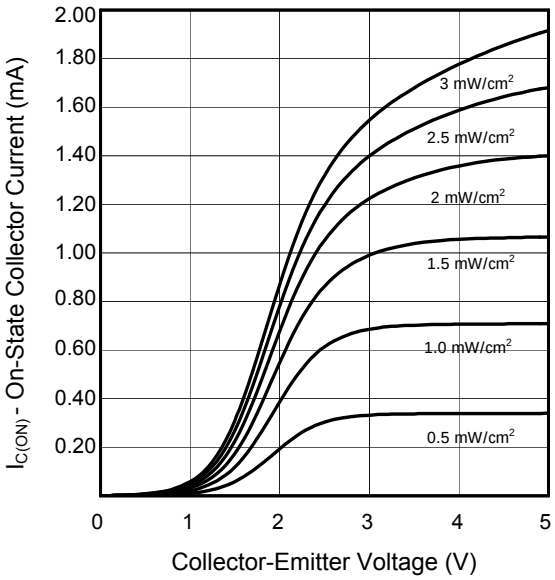


OP500, OP501

Collector-Emitter Dark Current vs. Temperature-T_A



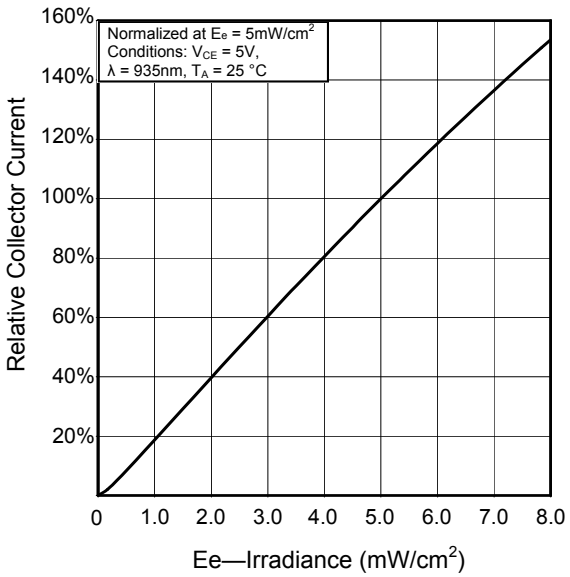
Relative On-State Collector Current – Ic (mA) vs. Collector-Emitter Voltage—V_{CE} (V)



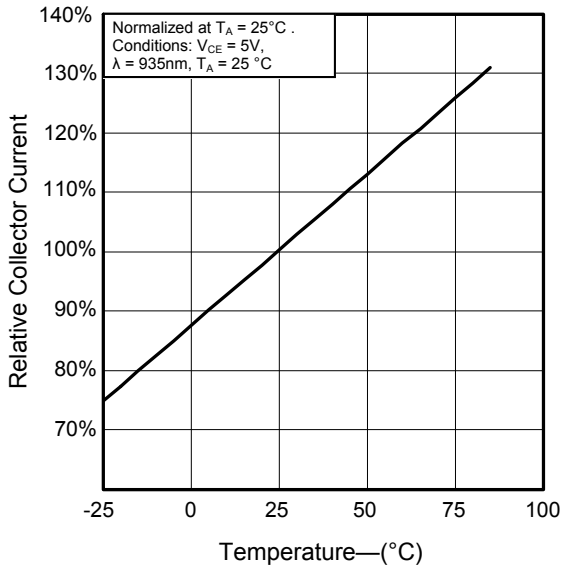
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OP500, OP501

Relative On-State Collector Current vs. Irradiance—Ee (mW/cm²)

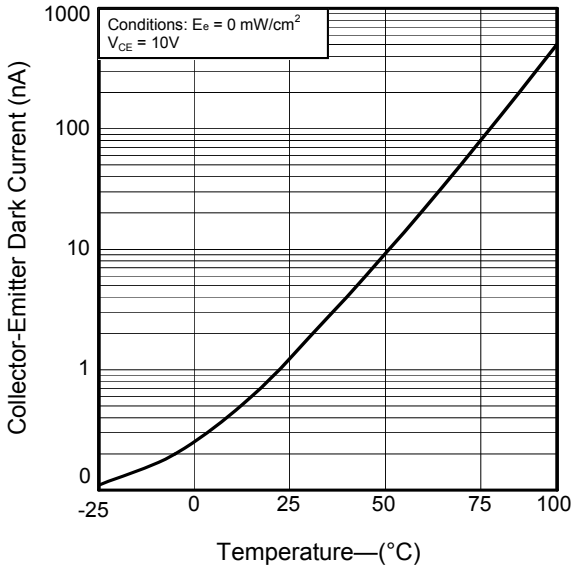


Relative On-State Collector Current-IC (mA) vs. Temperature-T_A

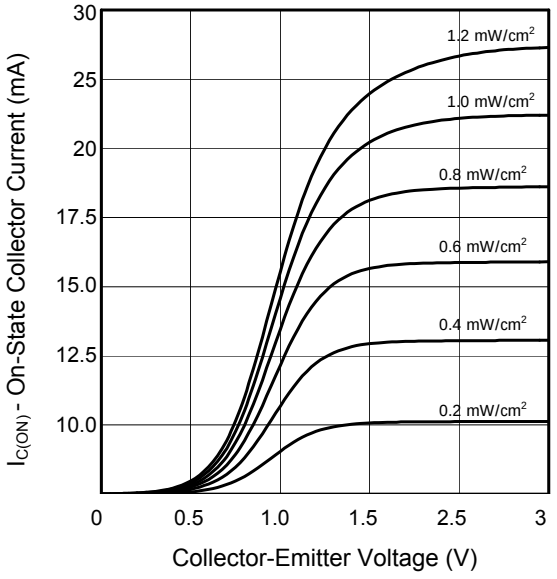


OP500DA, OP501DA

Collector-Emitter Dark Current vs. Temperature-T_A



Relative On-State Collector Current – Ic (mA) vs. Collector-Emitter Voltage—V_{CE} (V)

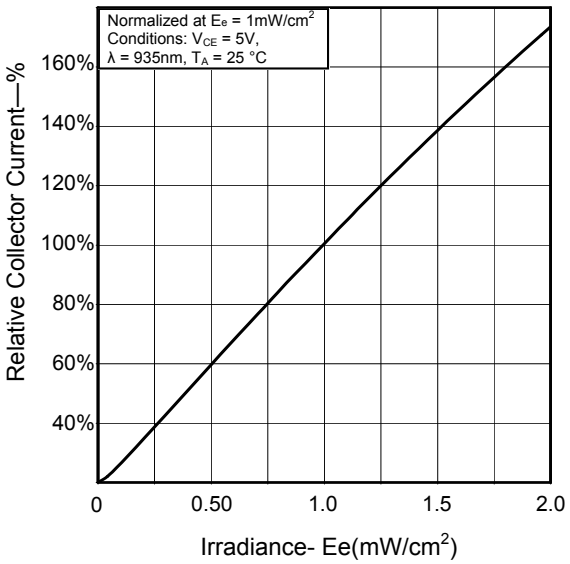


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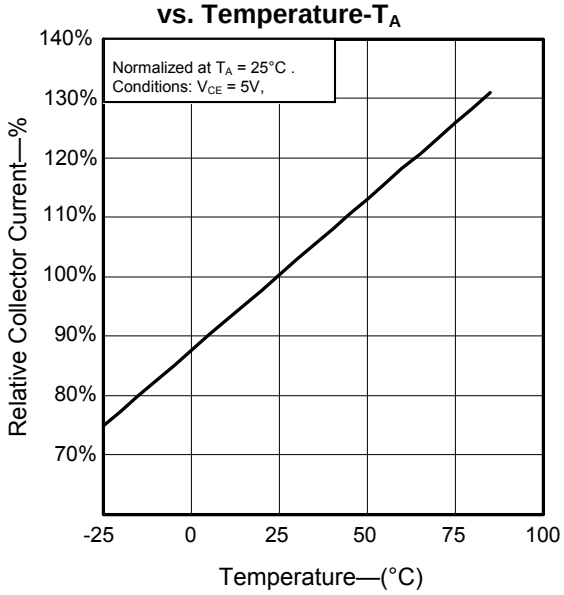
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OP500DA, OP501DA

Relative On-State Collector Current vs. Irradiance—Ee (mW/cm^2)



Relative On-State Collector Current-IC (mA) vs. Temperature-T_A



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