



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



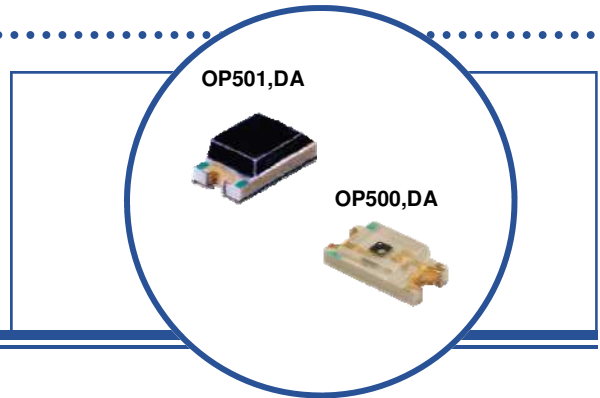
Silicon Phototransistor and Photo Darlington in Miniature 0805 SMD Package

OP500, OP501, OP500DA, OP501DA



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.

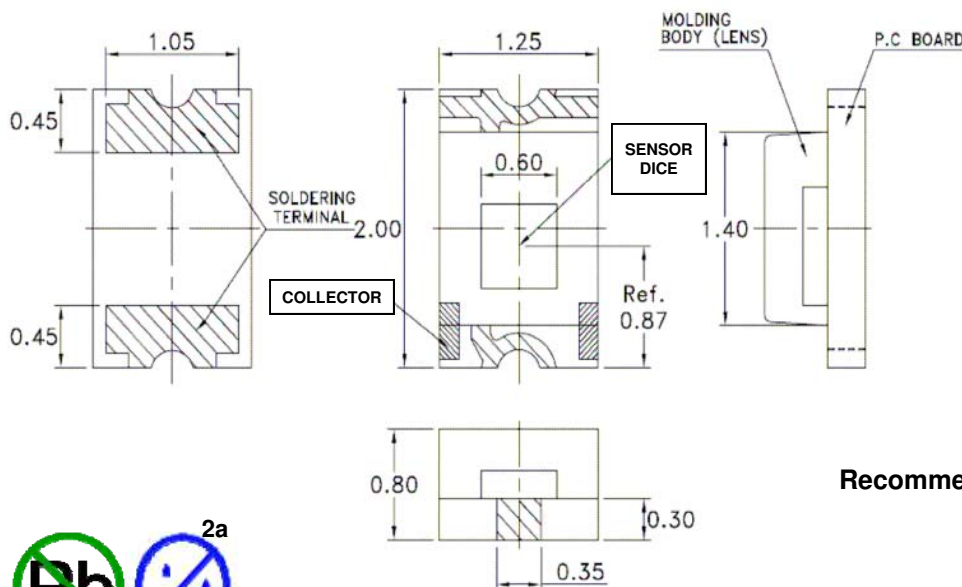
OP500, **OP501**, **OP500DA** and **OP501DA** are mechanically and spectrally matched to the **OP200** series infrared LEDs.

Applications:

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

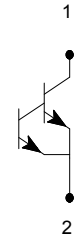
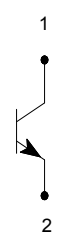
Ordering Information			
Part Number	Sensor	Viewing Angle	Lead Length
OP500	Phototransistor	150°	N/A
OP501			
OP500DA	Photo Darlington	150°	
OP501DA			

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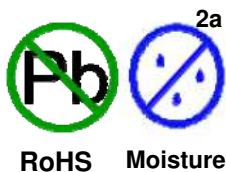
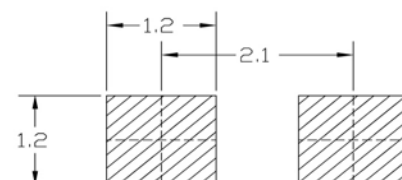
OP500
OP501

OP500DA
OP501DA



Pin #	Transistor
1	Collector
2	Emitter

Recommended Solder Pad Patterns



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

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Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ 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 ($T_A = 25^\circ\text{C}$ unless otherwise noted)

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
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Input Diode

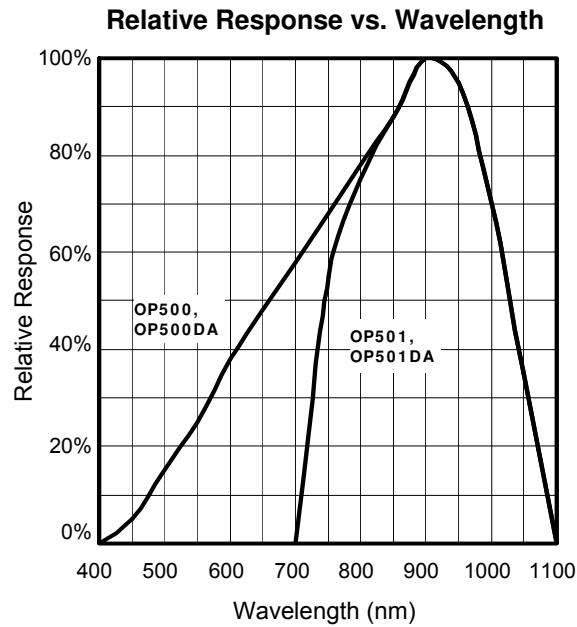
$I_{C(ON)}$	On-State Collector Current OP500, OP501 OP500DA, OP501DA	0.1 10.0	- -	- -	mA	$V_{CE} = 5.0\text{ V}, E_E = 0.15\text{ mW/cm}^2$ ⁽³⁾ $V_{CE} = 5.0\text{ V}, E_E = 0.15\text{ mW/cm}^2$ ⁽³⁾
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage OP500, OP501 OP500DA, OP501DA	- -	- -	0.3 1.0	V	$I_C = 100\ \mu\text{A}, E_E = 1.0\text{ mW/cm}^2$ ⁽³⁾ $I_C = 1\text{ mA}, E_E = 0.15\text{ mW/cm}^2$ ⁽³⁾
I_{CEO}	Collector-Emitter Dark Current	-	-	100	nA	$V_{CC} = 5.0\text{ V}$ ⁽⁴⁾
$V_{BR(CEO)}$	Collector-Emitter Breakdown Voltage OP500, OP501 OP500DA, OP501DA	30 35	-	-	V	$I_C = 100\ \mu\text{A}, E_E = 0$
$V_{BR(ECO)}$	Emitter-Collector Breakdown Voltage OP500, OP501 OP500DA, OP501DA	5 5	- -	- -	V	$I_E = 100\ \mu\text{A}, E_E = 0$ $I_C = 100\ \mu\text{A}, E_E = 0$
t_r, t_f	Rise and Fall Times OP500, OP501 OP500DA, OP501DA	-	15 50	- 60	μs	$I_C = 1\text{ mA}, R_L = 1\text{K}\Omega$ $I_C = 1\text{ mA}, R_L = 1\text{K}\Omega$

Notes:

- Solder time less than 5 seconds at temperature extreme.
- Derate linearly at 2.17 mW/° C above 25° C.
- 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.
- To calculate typical collector dark current in μA , use the formula $I_{CEO} = 10^{(0.04 T - 3)}$, where T_A is the ambient temperature in ° C.

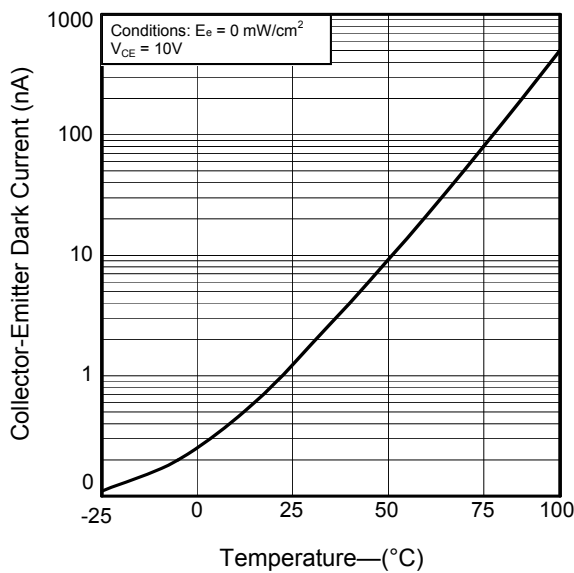
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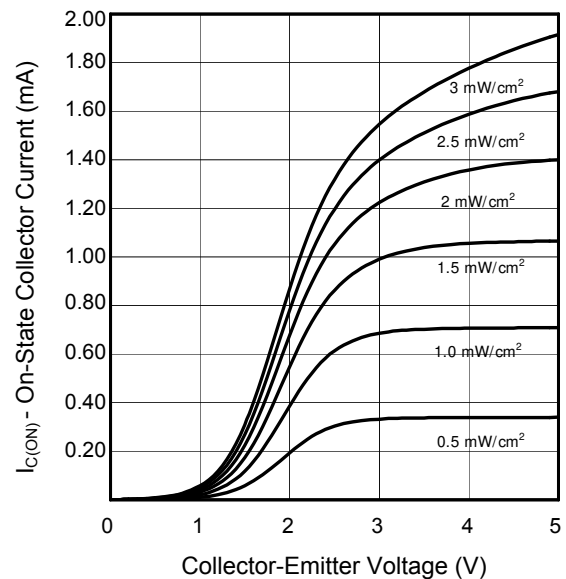


OP500, OP501

Collector-Emitter Dark Current vs. Temperature— T_A



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



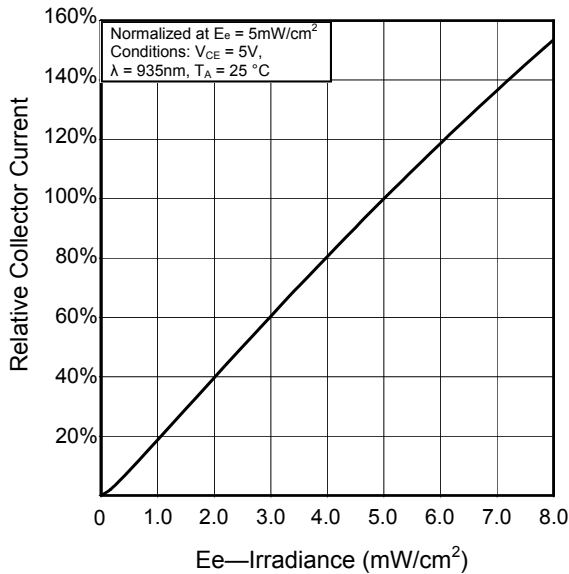
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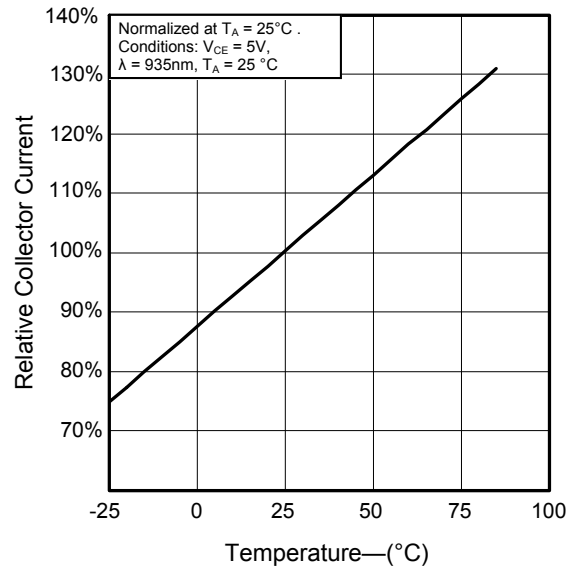


OP500, OP501

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

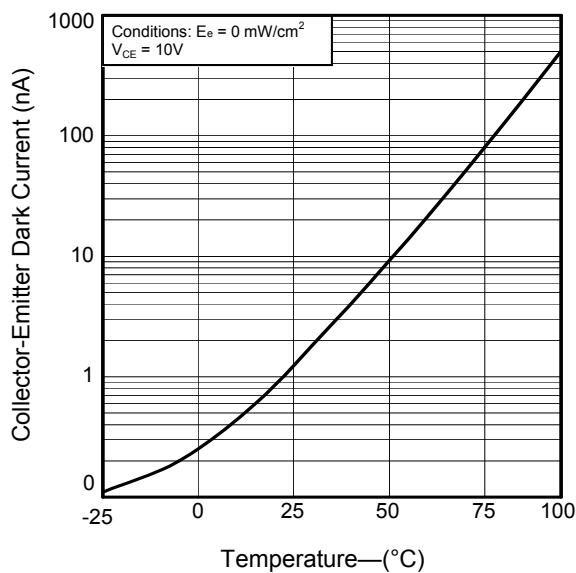


Relative On-State Collector Current- I_C (mA) vs. Temperature- T_A

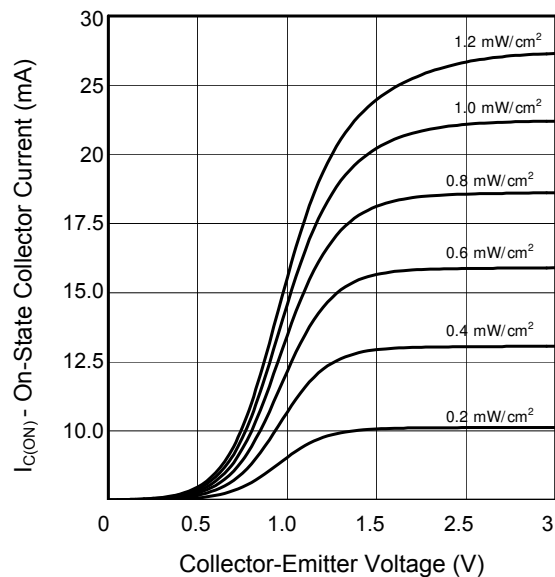


OP500DA, OP501DA

Collector-Emitter Dark Current vs. Temperature- T_A



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

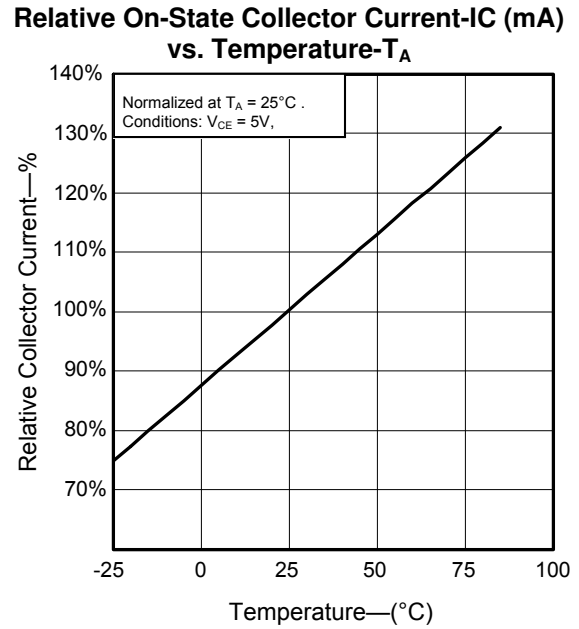
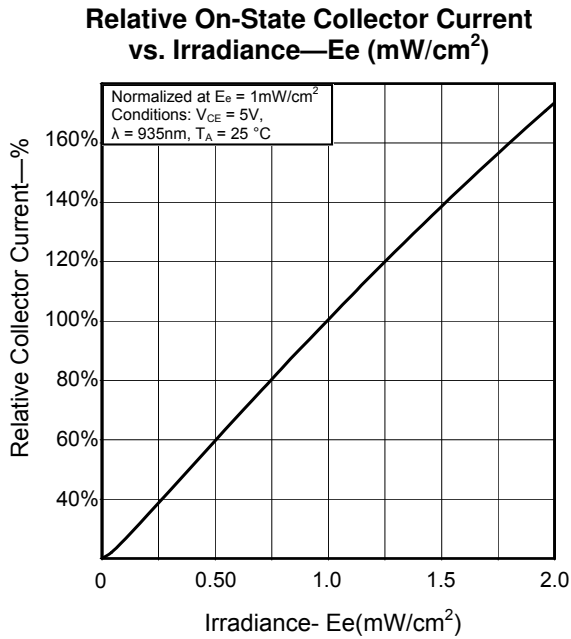


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OP500DA, OP501DA



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