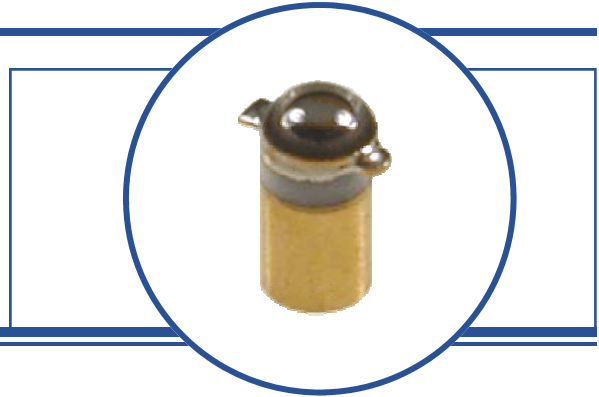


**Features:**

- Narrow receiving angle
- Variety of sensitivity ranges
- Enhanced temperature range
- PCBoard mounting
- Mechanically and spectrally matched to OP123 and OP223 LEDs



**Description:**

Each device in this series is a NPN silicon photodarlington in a hermetically sealed pill package with a narrow receiving angle that provides excellent on-axis coupling. Photodarlington are normally used in applications with low light signal levels, where more current gain is needed than phototransistors can provide.

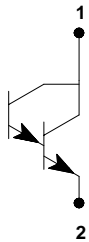
*Components in the OP300 series are mechanically and spectrally matched to the OP123 and OP223 series.*

Please refer to Application Bulletins 208 and 210 for additional design information and reliability (degradation) data, and to Application Bulletin 202 for pill-type soldering to PCBoard.

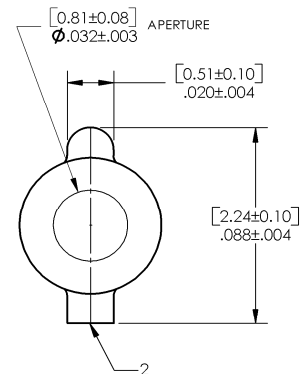
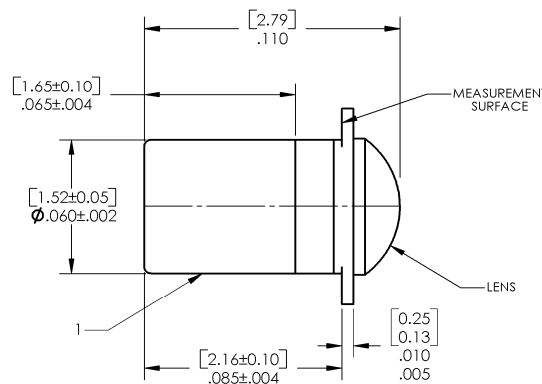
**Applications:**

- Non-contact reflective object sensor
- Assembly line automation
- Machine automation
- Machine safety
- End of travel sensor
- Door sensor

Ordering Information				
Part Number	Sensor	Light Current I <sub>C(ON)</sub> (mA) Min / Max	Input Power E <sub>E</sub> (mW/cm <sup>2</sup> )	Viewing Angle
OP300SL	Darlington	0.8 / NA	1.0 with 2870°K or 0.4 with 890nm	35°
OP301SL		0.8 / 2.4		
OP302SL		1.8 / 5.4		
OP303SL		3.6 / 12.0		
OP304SL		7.0 / 21.0		
OP305SL		14.0 / NA		



Pin #	Sensor
1	Collector
2	Emitter



DIMENSIONS ARE IN: [MILLIMETERS]  
 INCHES



**RoHS**

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

Collector-Emitter Voltage	15.0 V
Emitter-Collector Voltage	5.0 V
Storage Temperature Range	-65° C to +150° C
Operating Temperature Range	-65° C to +125° C
Soldering Temperature (5 seconds with soldering iron)	260° C <sup>(1)(2)</sup>
Power Dissipation	50 mW <sup>(3)</sup>
Continuous Collector Current	50 mA

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

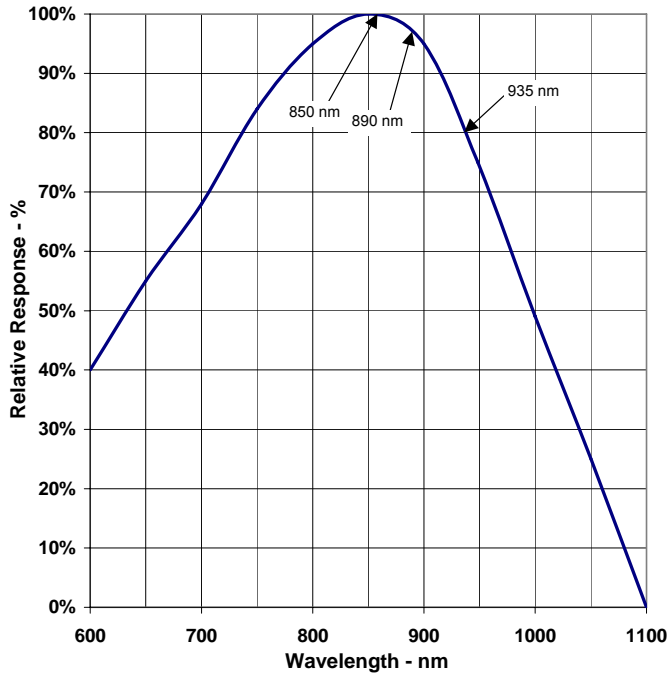
SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
$I_{C(ON)}$ <sup>(4)</sup>	On-State Collector Current	0.8	-	-	mA	$V_{CE} = 5.0\text{ V}, E_E = 1.0\text{ or }0.4\text{ mW/cm}^2$ <sup>(5)</sup>
	OP300SL	0.8	-	2.4		
	OP301SL	1.8	-	5.4		
	OP302SL	3.6	-	12.0		
	OP303SL	7.0	-	21.0		
	OP304SL OP305SL	14.0	-	-		
$I_{CEO}$	Collector-Dark Current	-	-	1.0	$\mu\text{A}$	$V_{CE} = 10\text{ V}, E_E = 0$
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	15.0	-	-	V	$I_C = 100\ \mu\text{A}$
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	5.0	-	-	V	$I_E = 100\ \mu\text{A}$
$V_{CE(SAT)}$ <sup>(4)</sup>	Collector-Emitter Saturation Voltage	-	-	1.1	V	$I_C = 0.4\text{ mA}, E_E = 1.0\text{ or }0.4\text{ mW/cm}^2$ <sup>(5)</sup> $I_C = 1.0\text{ mA}, E_E = 1.0\text{ or }0.4\text{ mW/cm}^2$ <sup>(5)</sup>
	OP300SL, OP301SL	-	-	1.1		
	OP302SL through OP305SL	-	-	1.1		

Notes:

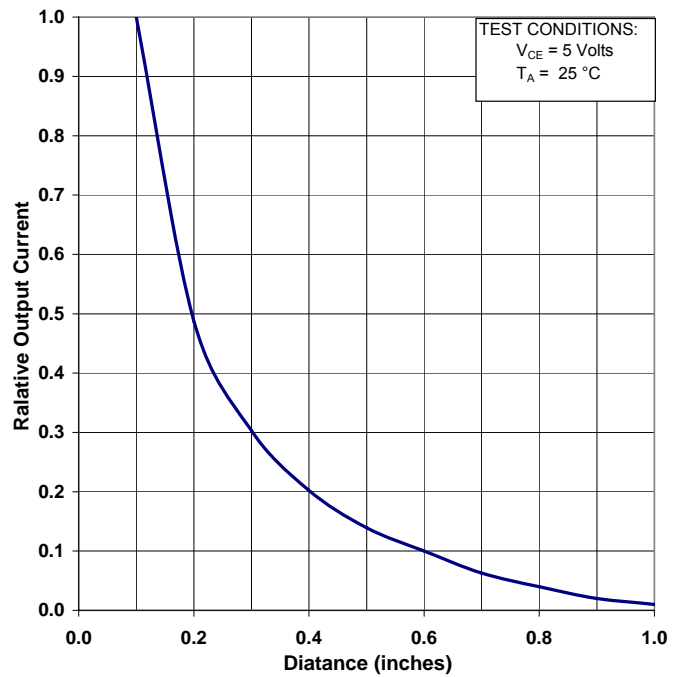
- (1) Refer to Application Bulletin 202, which discusses proper techniques for soldering pill-type devices to PCBoards.
- (2) No clean or low solids. RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering.
- (3) Derate linearly 0.5 mW/° C above 25° C.
- (4) Junction temperature maintained at 25° C.
- (5) Light source is an unfiltered tungsten bulb operating at  $CT = 2870^\circ\text{K}$  at  $E_E = 1.0\text{ mW/cm}^2$  or 890nm at  $E_E = 0.4\text{ mW/cm}^2$ .

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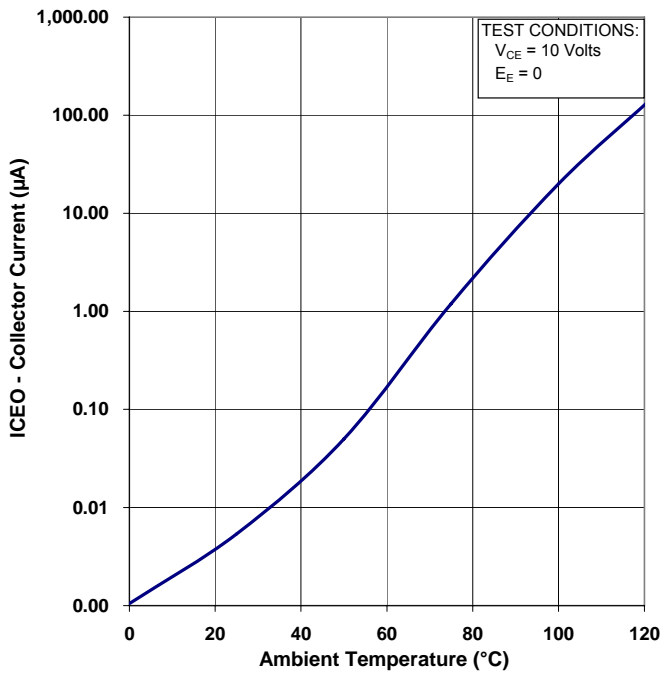
**Typical Spectral-Response**



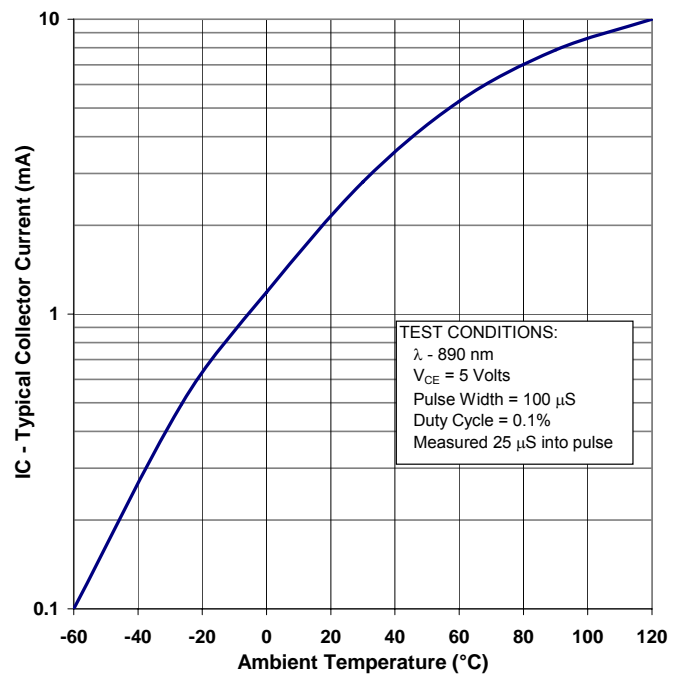
**Coupling Characteristics of OP123 & OP300SL**



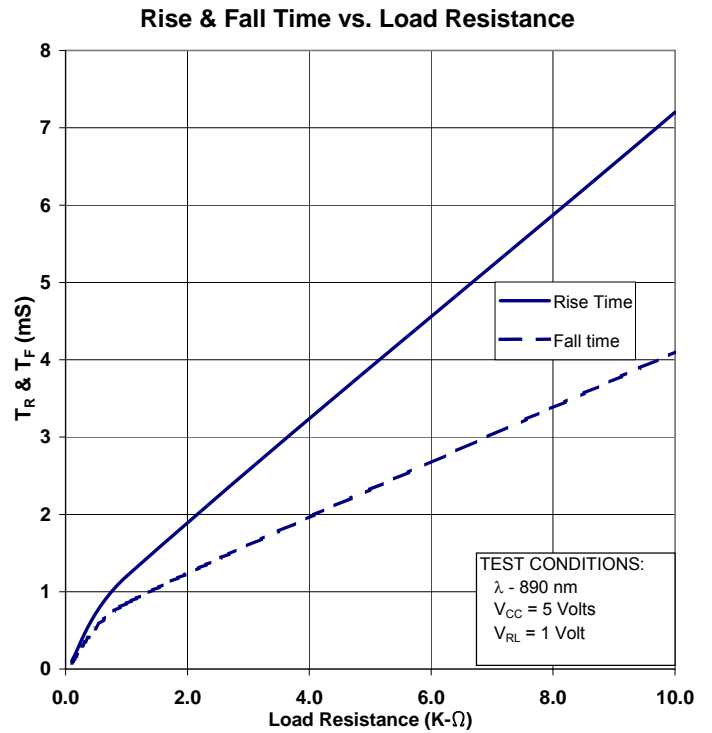
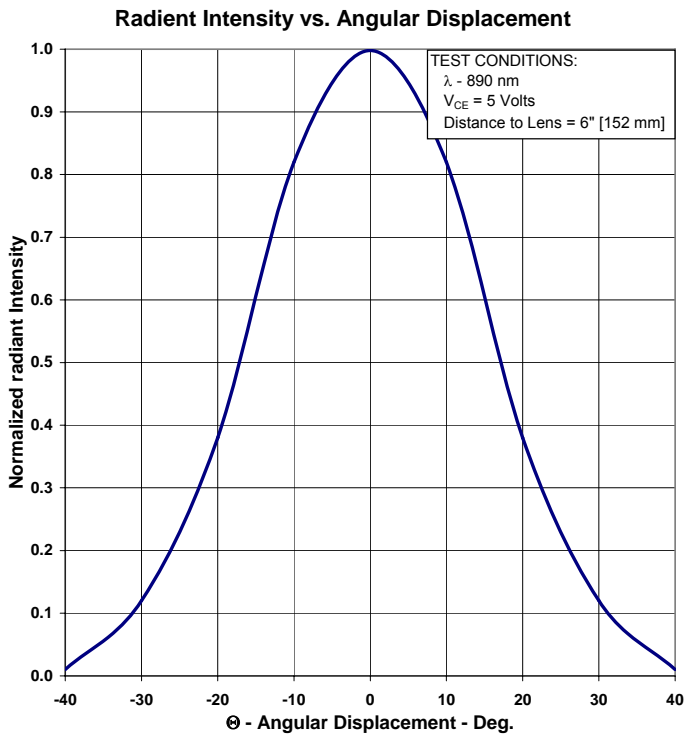
**Dark Current vs Temperature**



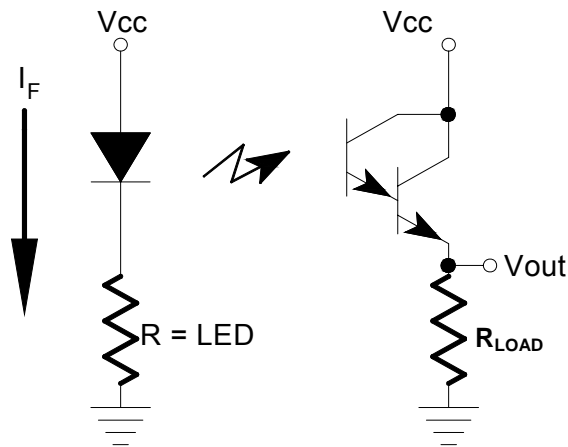
**Collector Current vs Temperature**



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### Switching time Circuit



The light source is a pulsed LED with a rise time of less than 500 nS.  
 The LED output is adjusted for  $I_C = 0.8$  mA.

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