

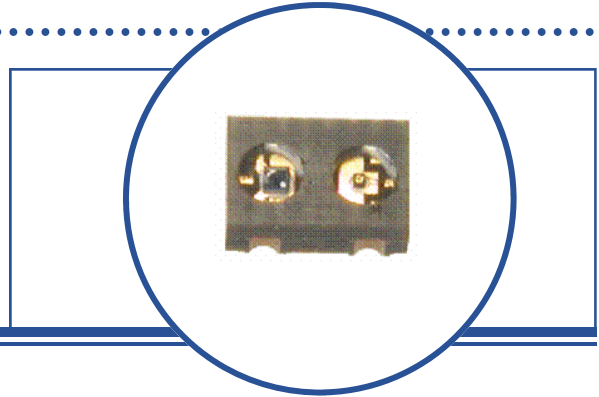
# Miniature SMD Reflective Sensor

## OPR5005



### Features:

- High temperature operation
- Surface mountable
- Compact size
- Excellent ambient light protection



### Description:

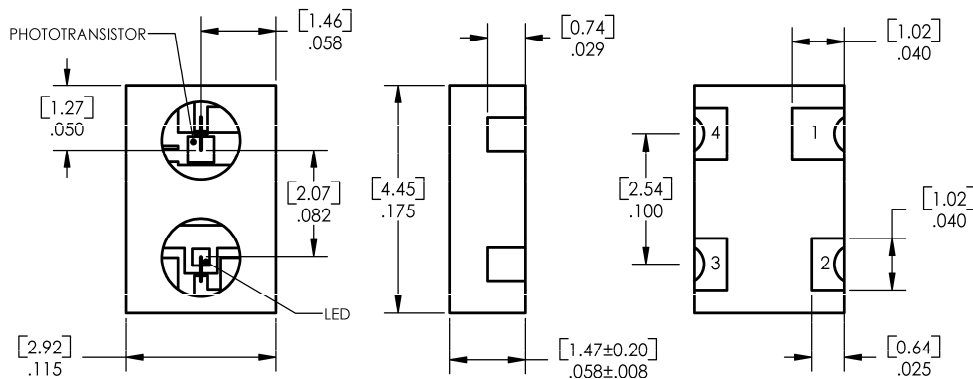
The **OPR5005** is a miniature reflective sensor that combines a silicon phototransistor with a GaAlAs LED in a high-temperature opaque polyamide chip carrier. It is designed to sense the motion or proximity of diffuse reflective surfaces in space-limited applications.

Its opaque package insures very low cross-talk and shields the phototransistor from ambient light sources, while the silicone encapsulated package allows operation over a wide temperature range. The gold-plated wraparound solder pads offer exceptional storage and wetting characteristics.

### Applications:

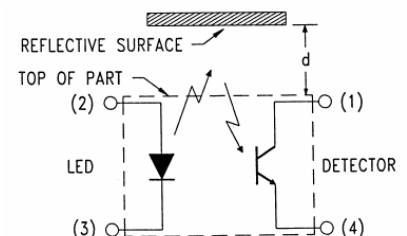
- Motion sensors
- Space-limited applications
- Applications requiring ambient light protection
- Can be stored in dirty environments

Ordering Information						
Reflective Switch Part Number	LED Peak Wavelength	Sensor	# of Elements	I <sub>C(ON)</sub> (μA) Min / Typ	I <sub>F</sub> (mA) Typ / Max	V <sub>CE</sub> Typ / Max
OPR5005	890 nm	Phototransistor	2	750	20 / 50	5 / 30



TOLERANCE IS ± .005 [ 0.13 ]  
DIMENSIONS ARE IN INCHES AND [MILLIMETERS].

Pin #	Description
1	Collector
2	Anode
3	Cathode
4	Emitter



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)

Storage and Operating Temperature	-55°C to +125° C
Solder reflow time within 5°C of peak temperature is 20 to 40 seconds <sup>(1)</sup>	250° C

**Input Diode**

Forward DC Current	50 mA
Peak Forward Current (1 us pulse with 300 pps)	1.0 A
Reverse DC Voltage	2.0 V
Power Dissipation <sup>(2)</sup>	75 mW

**Output Phototransistor**

Collector-Emitter Voltage	30 V
Emitter-Collector Voltage	5.0 V
Collector DC Current <sup>(2)</sup>	25 mA
Power Dissipation	75 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**

$V_F$	Forward Voltage	-	-	1.7	V	$I_F = 20\text{ mA}$
$I_R$	Reverse Current	-	-	100	$\mu\text{A}$	$V_R = 2.0\text{ V}$

**Output Phototransistor**

$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	30	-	-	V	$I_C = 100\ \mu\text{A}$
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	5	-	-	V	$I_E = 100\ \mu\text{A}$
$I_{CEO}$	Collector Dark Current	-	-	100	nA	$V_{CE} = 5.0\text{ V}, I_F = 0,$ $E_E = \leq 0.10\ \mu\text{W}/\text{cm}^2$

**Combined**

$I_{C(ON)}$	On-State Collector Current	100	-	-	$\mu\text{A}$	$V_{CE} = 5.0\text{ V}, I_F = 20\text{ mA},$ $d = 0.050'' (1.27\text{ mm})^{(3)(4)}$
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage	-	-	0.4	V	$I_F = 20\text{ mA}, I_C = 100\ \mu\text{A},$ $d = 0.050'' (1.27\text{ mm})^{(3)(4)}$

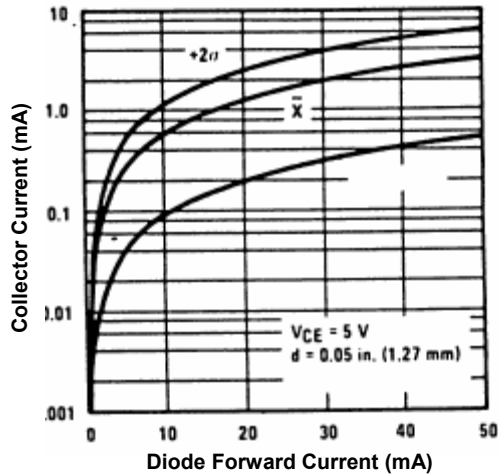
Notes:

- (1) Solder time less than 5 seconds at temperature extreme.
- (2) Derate linearly 0.75 mW/°C above 25°C.
- (3) Distance from the assembly face to the reflective surface is "d".
- (4) Measured using Eastman Kodak neutral white test card with 90% white diffuse reflectance as a reflecting surface.
- (5) Crosstalk ( $I_{CX}$ ) is the collector current measured using the indicated current in the input diode and not using a reflective surface.

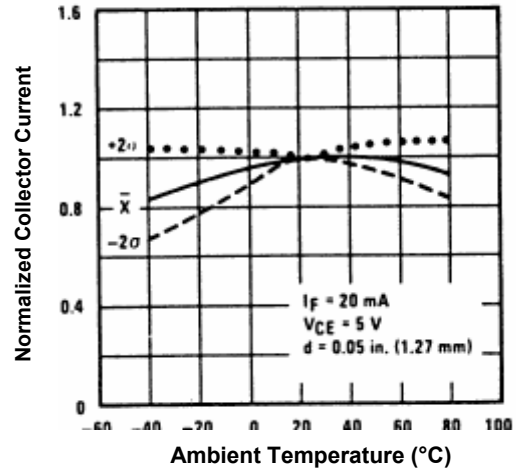
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OPR5005

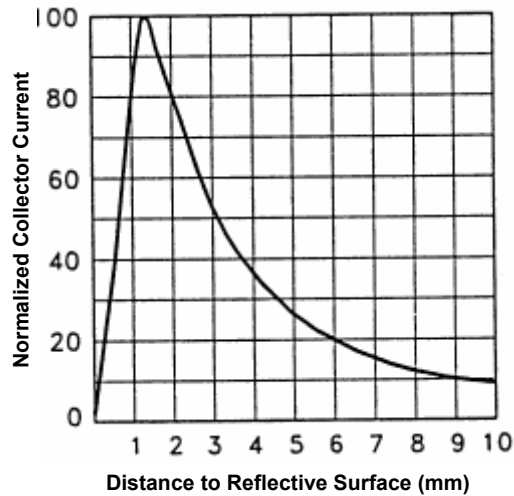
Collector Current vs Diode Forward Current



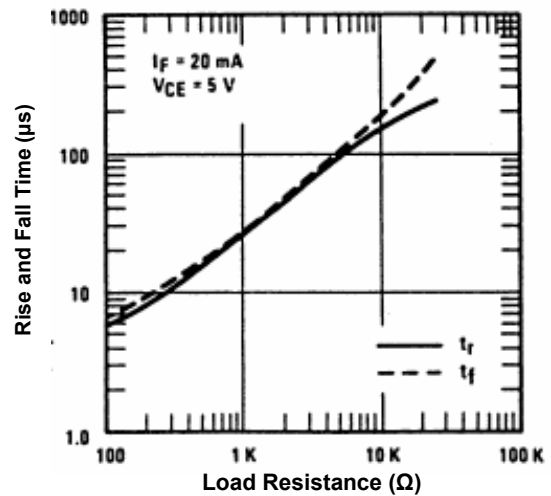
Normalized Collector Current vs Ambient Temperature



Normalized Collector Current vs Object Distance



Rise and Fall Time vs Load Resistance



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