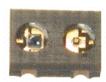
# Minature SMD Reflective Sensor

# **OPR5005**



#### **Features:**

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



### Description:

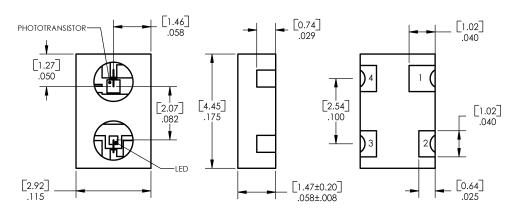
The **OPR5005** is a miniature reflective sensor that combines a silicon phototransistor with a GaAlAs LED in a high-temperature opaque polyamide chip carrier. It is designed to sense the motion or proximity of diffuse reflective surfaces in space-limited applications. The opaque package insures very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

See Application Bulletin 237 for handling instructions.

## **Applications:**

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

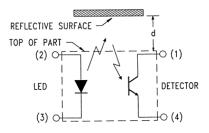
Ordering Information									
Reflective Switch Part Number	LED Peak Wavelength	Sensor	# of Elements	I <sub>C(ON)</sub> (μΑ) Min	I <sub>F</sub> (mA) Typ / Max	V <sub>CE</sub> Typ / Max	Packaging		
OPR5005	890 nm	Phototransistor	2	725	20 / 50	5/30	Chip Tray		



TOLERANCE IS  $\pm$  .005 [ 0.13 ] DIMENSIONS ARE IN INCHES AND [MILLIMETERS].

Warning: Front Windows are pressure sensitive. Do not apply pressure or high vacuum to window.

Pin#	Description
1	Collector
2	Anode
3	Cathode
4	Emitter









# Minature SMD Reflective Sensor



# **Electrical Specifications**

<b>Absolute Maximum Ratings</b> (T <sub>A</sub> = 25° 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
LED	·
Forward DC Current	50 mA
Peak Forward Current (1 μs pulse; .03% duty cycle)	1.0 A
Reverse DC Voltage	2.0 V
Power Dissipation <sup>(2)</sup>	75 mW
Phototransistor	
Collector-Emitter Voltage	30 V
Emitter-Collector Voltage	5.0 V
Collector DC Current	25 mA
Power Dissipation <sup>(2)</sup>	75 mW

Electrical	<b>Characteristics</b> (T <sub>A</sub> = 25° C unless otherwis	e noted	1)			
SYMBOL	PARAMETER		TYP	MAX	UNITS	TEST CONDITIONS
LED						
V <sub>F</sub>	Forward Voltage		-	1.7	٧	I <sub>F</sub> = 20 mA
I <sub>R</sub>	Reverse Current		-	100	μΑ	V <sub>R</sub> = 2.0 V
Phototrans	istor					
V <sub>(BR)CEO</sub>	Collector-Emitter Breakdown Voltage		-	-	V	Ι <sub>C</sub> = 100 μΑ
V <sub>(BR)ECO</sub>	Emitter-Collector Breakdown Voltage		-	-	V	Ι <sub>Ε</sub> = 100 μΑ
I <sub>CEO</sub>	Collector Dark Current		-	100	nA	$V_{CE} = 5.0 \text{ V, } I_F = 0,$ $E_e = \le 0.10  \mu\text{W/cm}^2$
Combined						
I <sub>C(ON)</sub>	On-State Collector Current <sup>(4)</sup>		-	-	μΑ	$V_{CE} = 5.0 \text{ V}, I_F = 20 \text{ mA},$ $d = 0.050'' (1.27 \text{ mm})^{(3)}$
V <sub>CE(SAT)</sub>	Collector-Emitter Saturation Voltage <sup>(4)</sup>		-	0.4	V	I <sub>F</sub> = 20 mA, I <sub>C</sub> = 100 μa, d = 0.050" (1.27 mm) <sup>(3)</sup>
I <sub>CX</sub>	Crosstalk (5)		-	75	μΑ	I <sub>F</sub> = 20mA, V <sub>CE</sub> = 5V

### 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<sub>CX</sub>) is the collector current measured using the indicated current and using a Munsell N2.25 black test card against the face of the part.

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# Minature SMD Reflective Sensor



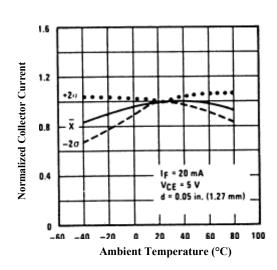
## **Performance**

# OPR5005

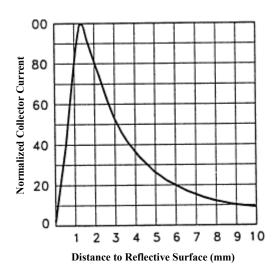
#### **Collector Current vs Diode Forward**

# 10 VCE = 5 V d = 0.05 in. (1.27 mm) 001 0 10 20 30 40 50 Diode Forward Current (mA)

#### **Normalized Collector Current vs**



### **Normalized Collector Current vs**



### Rise and Fall Time vs Load

