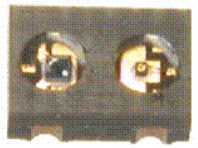
Minature SMD Reflective Sensor

OPR5005



Features:

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

Description:

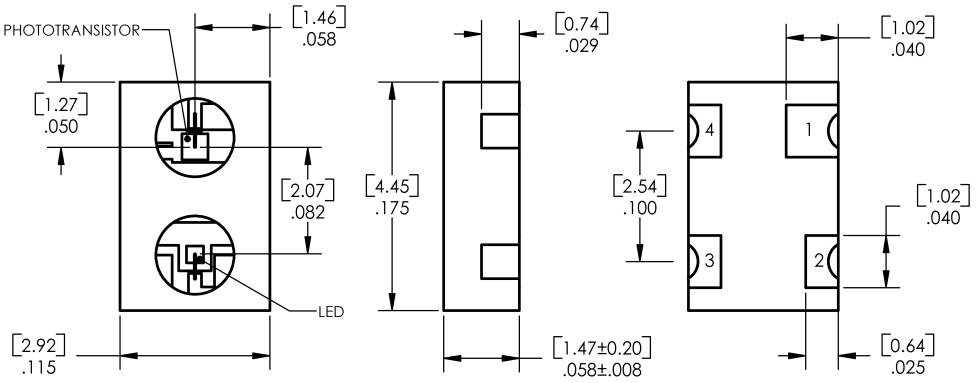
The **OPR5005** is a miniature reflective sensor that combines a silicon phototransistor with a GaAlAs LED in a high-temperature opaque polyamide chip carrier. It is designed to sense the motion or proximity of diffuse reflective surfaces in space-limited applications. The opaque package insures very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

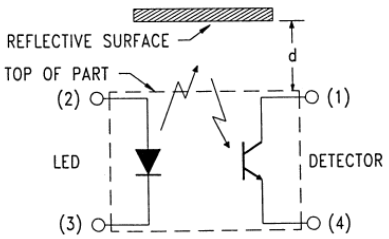
Ordering Information							
Reflective Switch Part Number	**LED Peak Wavelength**	**Sensor**	**# of Elements**	**$I_{C(ON)}$ (µA) Min**	**I_F (mA) Typ / Max**	**V_{CE} Typ / Max**	**Packaging**
OPR5005	890 nm	Phototransistor	2	725	20 / 50	5 / 30	Chip Tray



TOLERANCE IS ± .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



RoHS

MOISTURE (Level-4)

ESD (Human Body Model)

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Electrical Specifications

Absolute Maximum Ratings (T_A = 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[1]	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[2]	75 mW
Phototransistor	
Collector-Emitter Voltage	30 V
Emitter-Collector Voltage	5.0 V
Collector DC Current	25 mA
Power Dissipation[2]	75 mW

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

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
LED						
V_F	Forward Voltage	-	-	1.7	V	I_F = 20 mA
I_R	Reverse Current	-	-	100	µA	V_R = 2.0 V
Phototransistor						
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	30	-	-	V	I_C = 100 µA
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	5	-	-	V	I_E = 100 µA
I_{CEO}	Collector Dark Current	-	-	100	nA	V_{CE} = 5.0 V, I_F = 0, E_e = ≤ 0.10 µW/cm^2
Combined						
$I_{C(ON)}$	On-State Collector Current[4]	725	-	-	µA	V_{CE} = 5.0 V, I_F = 20 mA, d = 0.050" (1.27 mm)[3]
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage[4]	-	-	0.4	V	I_F = 20 mA, I_C = 100 µa, d = 0.050" (1.27 mm)[3]
I_{CX}	Crosstalk [5]	-	-	75	µA	I_F = 20mA, V_{CE} = 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_{CX}) 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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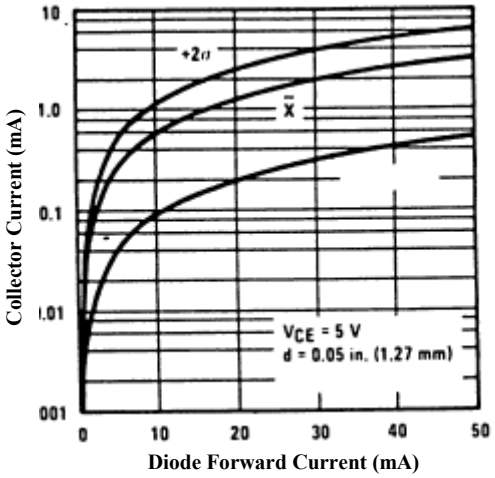
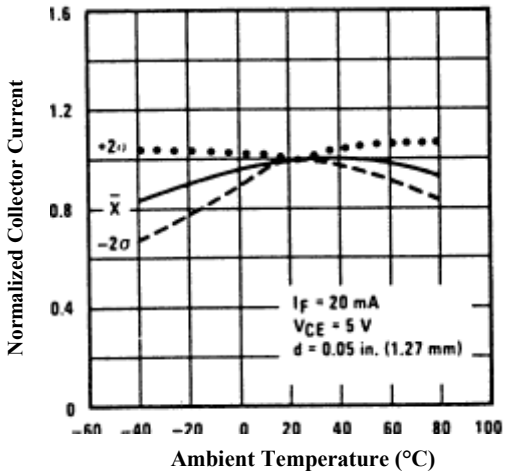
Performance

OPR5005

Collector Current vs Diode Forward



Normalized Collector Current vs



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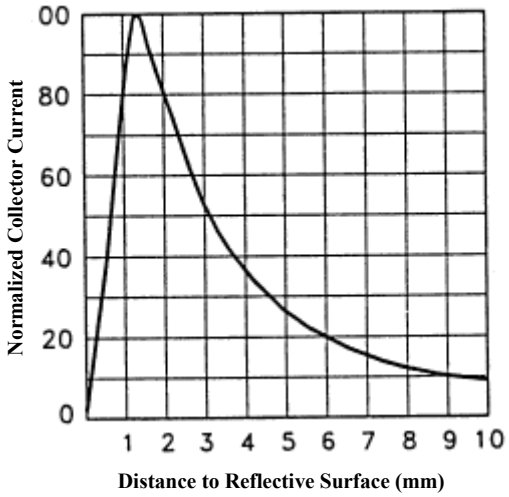
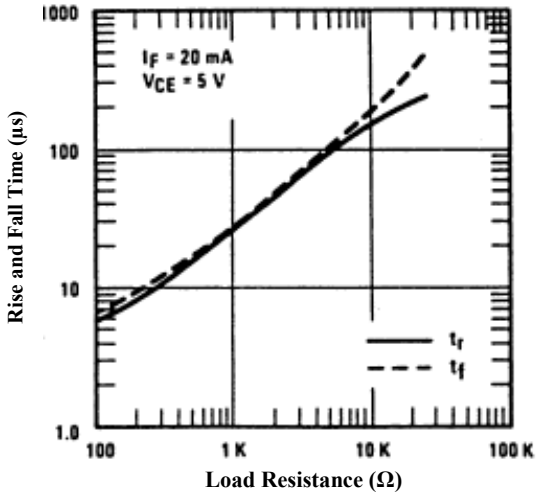


Rise and Fall Time vs Load



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