

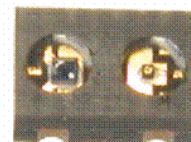
Miniature SMD Reflective Sensor

OPR5005



Features:

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



Description:

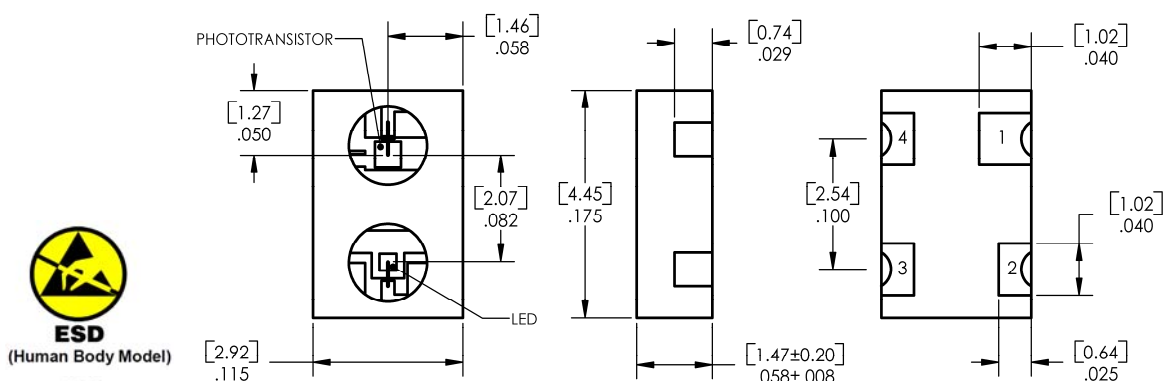
The **OPR5005** is a miniature reflective sensor that combines a silicon phototransistor with a GaAlAs LED in a high-temperature opaque polyamide chip carrier. It is designed to sense the motion or proximity of diffuse reflective surfaces in space-limited applications. The opaque package insures very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

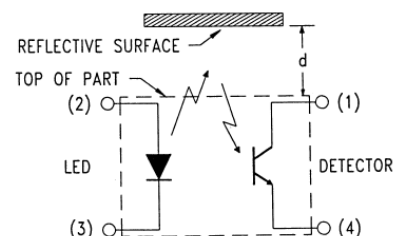
Ordering Information							
Reflective Switch Part Number	LED Peak Wavelength	Sensor	# of Elements	I _{C(ON)} (μA) Min / Typ	I _F (mA) Typ / Max	V _{CE} Typ / Max	Packaging
OPR5005	890 nm	Phototransistor	2	750	20 / 50	5 / 30	Chip Tray



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



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 ⁽¹⁾	250° C

LED

Forward DC Current	50 mA
Peak Forward Current (1 μs pulse; 10% 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 ($T_A = 25^{\circ}\text{C}$ unless otherwise noted)

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
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LED

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

Phototransistor

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

Combined

$I_{C(ON)}$	On-State Collector Current ⁽⁴⁾	100	-	-	μA	$V_{CE} = 5.0\text{ V}$, $I_F = 20\text{ mA}$, $d = 0.050''$ (1.27 mm) ⁽³⁾
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage ⁽⁴⁾	-	-	0.4	V	$I_F = 20\text{ mA}$, $I_C = 100\text{ }\mu\text{A}$, $d = 0.050''$ (1.27 mm) ⁽³⁾
I_{CX}	Crosstalk ⁽⁵⁾	-	-	75	μA	$I_F = 20\text{ mA}$, $V_{CE} = 5\text{ V}$

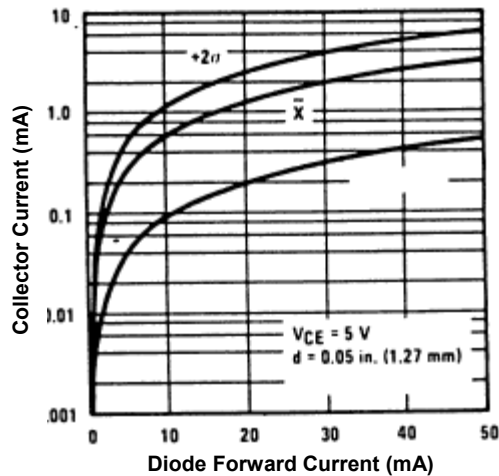
Notes:

- (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.

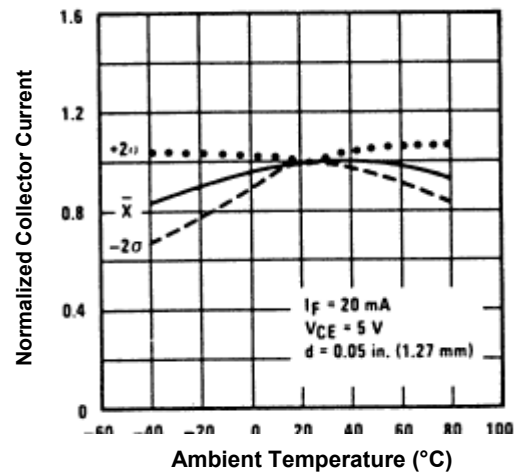
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OPR5005

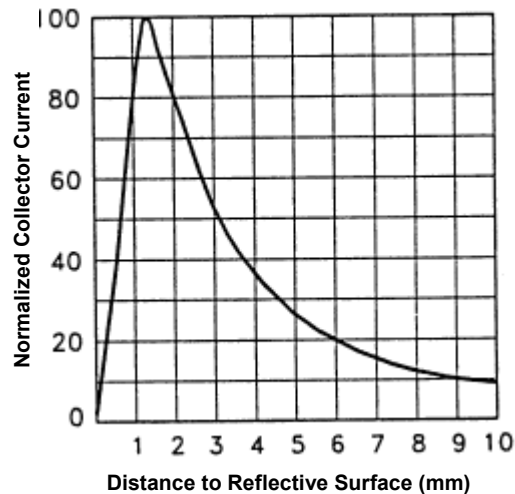
Collector Current vs Diode Forward Current



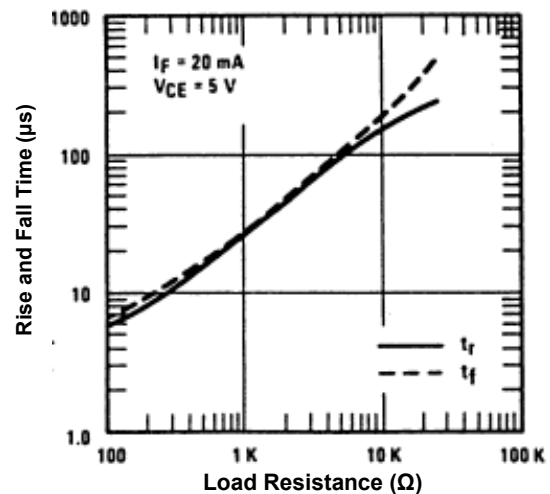
Normalized Collector Current vs Ambient Temperature



Normalized Collector Current vs Object Distance



Rise and Fall Time vs Load Resistance



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