

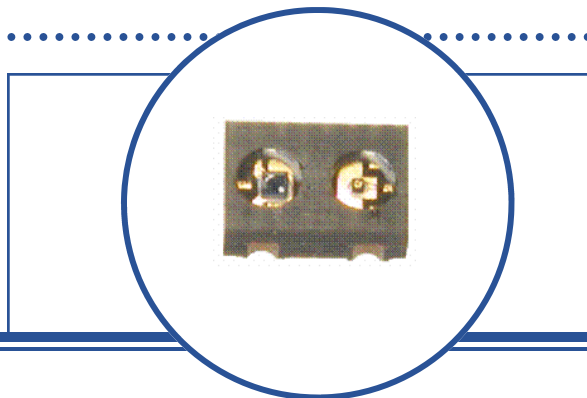
Miniature SMD Reflective Sensor

OPR5005



Features:

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



Description:

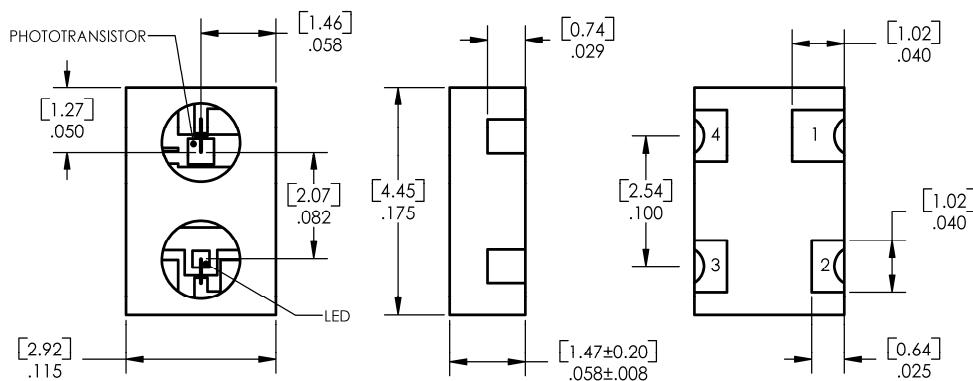
The **OPR5005** is a miniature reflective sensor that combines a silicon phototransistor with a GaAlAs LED in a high-temperature opaque polyamide chip carrier. It is designed to sense the motion or proximity of diffuse reflective surfaces in space-limited applications. The opaque package insures very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

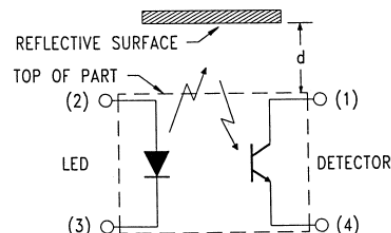
Ordering Information							
Reflective Switch Part Number	LED Peak Wavelength	Sensor	# of Elements	I _{C(ON)} (μA) Min / Typ	I _F (mA) Typ / Max	V _{CE} Typ / Max	Packaging
OPR5005	890 nm	Phototransistor	2	750	20 / 50	5 / 30	Chip Tray



TOLERANCE IS ± .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

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

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 ⁽²⁾	75 mW

Output Phototransistor

Collector-Emitter Voltage	30 V
Emitter-Collector Voltage	5.0 V
Collector DC Current ⁽²⁾	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
--------	-----------	-----	-----	-----	-------	-----------------

Input Diode

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

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

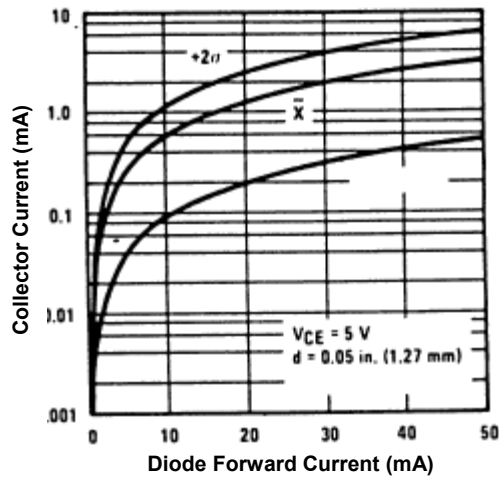
Notes:

- (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.

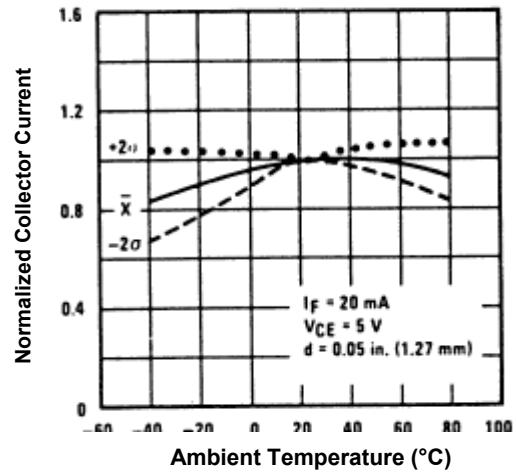
OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.

OPR5005

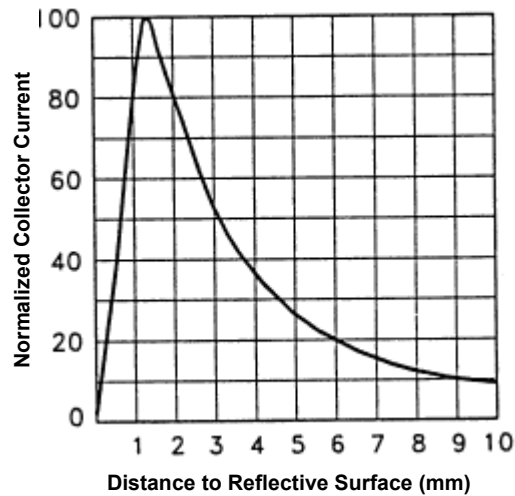
Collector Current vs Diode Forward Current



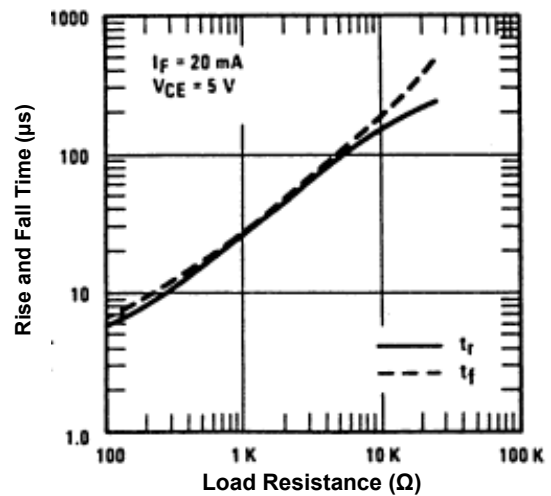
Normalized Collector Current vs Ambient Temperature



Normalized Collector Current vs Object Distance



Rise and Fall Time vs Load Resistance



OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.