

OPB733TR



Features:

- Unfocused for sensing diffuse surfaces
- Uses lensed devices for collimation of light beam
- Low-cost plastic housing
- Compact surface mount package 0.300" x 0.160" x 0.114"
[7.6 mm x 4.1 mm x 2.9 mm]
- Typical peak light emission wavelength 890 nm
- Reduced visible ambient light sensitivity
- Optimal operating distance range 0.4" [10.2 mm] to 1.0" [25.4 mm]

Description:

The **OPB733TR** consists of an 890 nm, Infrared Light Emitting Diode (LED) and an NPN silicon Phototransistor, which are mounted “side-by-side” on parallel axes in a miniature surface mount grey plastic housing. The Phototransistor is molded in a grey epoxy package, which minimizes visible ambient light sensitivity. The phototransistor responds to radiation from the LED when a reflective object passes within its field of view. This unfocused reflective object sensor is ideal for non-contact detection of materials such as paper, labels, white plastic and many other reflective materials.

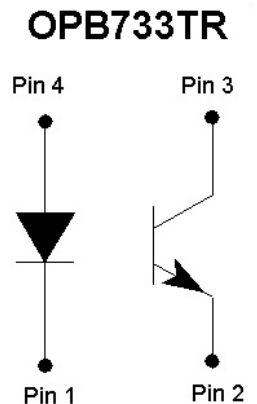
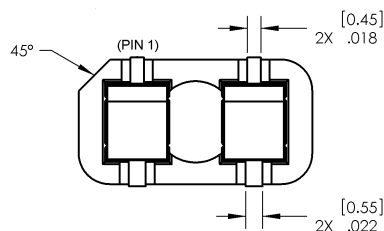
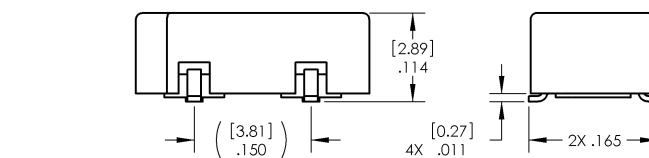
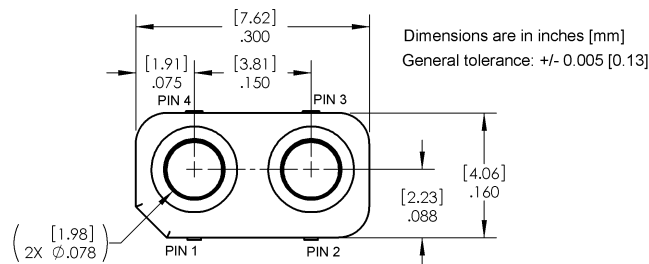
The OPB733TR sensors are packaged in 16 mm tape on 7" [178 mm] diameter reels, 500 pcs per reel. Tape and Reel package compatible with most automatic placement equipment.

For application information, refer to Application Bulletins 248 and 213

Ordering Information	
Part Number	Description
OPB733TR	SMD Reflective Object Sensor

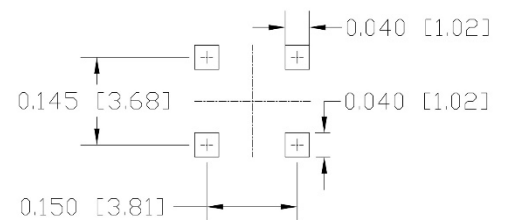
Applications:

- Assembly line automation
- ATM (Card Reader, Receipt Dispenser)
- Auto-dispense equipment
- Amusement equipment
- End-of-travel sensor
- Door sensor
- Edge detection
- Paper jam detection
- Mark detection
- Counters and sorters
- Proximity sensing
- Medical equipment
- Machine safety

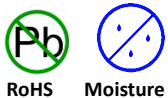


Pin #	Function
1	Cathode
2	Emitter
3	Collector
4	Anode

Recommended Solder Pad



Dimensions are in inches (mm)



General Note

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Electrical Specifications

Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Storage and Operating Temperature Range	-25° C to +85° C
Soldering Temperature. (see reflow solder temperature profile figure) ⁽⁴⁾	260° C
Input LED	
Forward DC Current	50 mA
Peak Forward Current (1 μs pulse width, 300 pps)	1 A
Reverse DC Voltage	5 V
Power Dissipation ⁽⁵⁾	130 mW
Output Phototransistor	
Collector-Emitter Voltage	30 V
Emitter-Collector Voltage	5 V
Collector DC Current	20 mA
Power Dissipation ⁽⁶⁾	75 mW

Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input IR LED						
V _F	Forward Voltage	1.0	-	1.7	V	I _F = 20 mA
I _R	Reverse Current	-	-	10	μA	V _R = 5 V
θ _{HP}	Emission angle at half power points	-	25	-	Degree	I _F = 20 mA
λ _P	Peak Emission Wavelength	-	890	-	nm	I _F = 10mA
Output 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} = 10 V, I _F = 0
t _r	Rise Time	-	15	-	μs	V _{CE} = 5 Volts ⁽³⁾ I _C = 1 mA R _L = 1KΩ
t _f	Fall Time	-	15	-	μs	
Coupled Characteristics						
V _{CE(SAT)} ⁽¹⁾⁽²⁾	Collector Emitter Saturation Voltage	-	-	0.4	V	d = 0.5" (12.7 mm) I _C = 50 μA, I _F = 20 mA
I _{C(ON)} ⁽¹⁾⁽²⁾	On-State Collector Current	0.1	-	-	mA	d = 0.5" (12.7 mm) I _F = 20 mA, V _{CE} = 5 V

Notes:

- (1) "d" is the distance from the assembly's top surface to the reflective surface.
- (2) Measured using Eastman Kodak neutral white test card with 90% diffuse reflectance as a reflecting surface.
- (3) By designed but not tested.
- (4) Methanol or Isopropanol are recommended as cleaning agents. Plastic housing is soluble in chlorinated hydrocarbons and ketones.
- (5) Derate linearly 1.83 mW/° C
- (6) Derate linearly 1.08 mW/° C

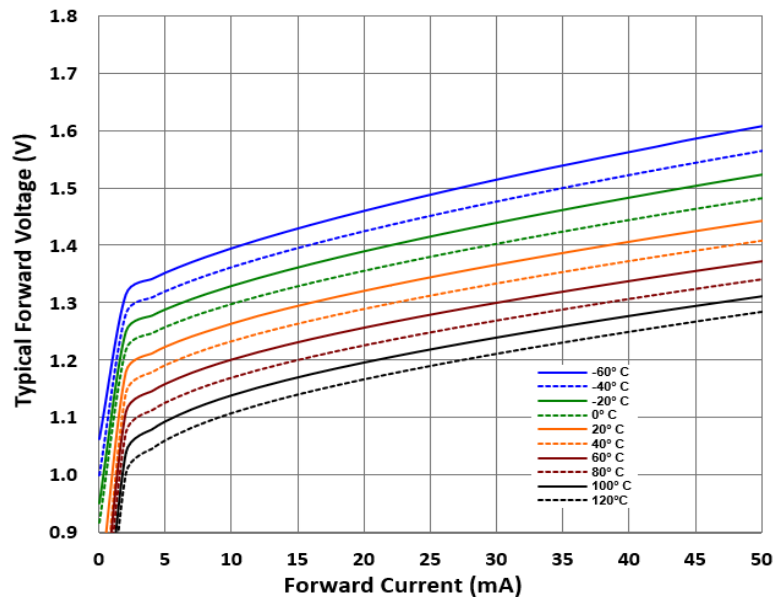
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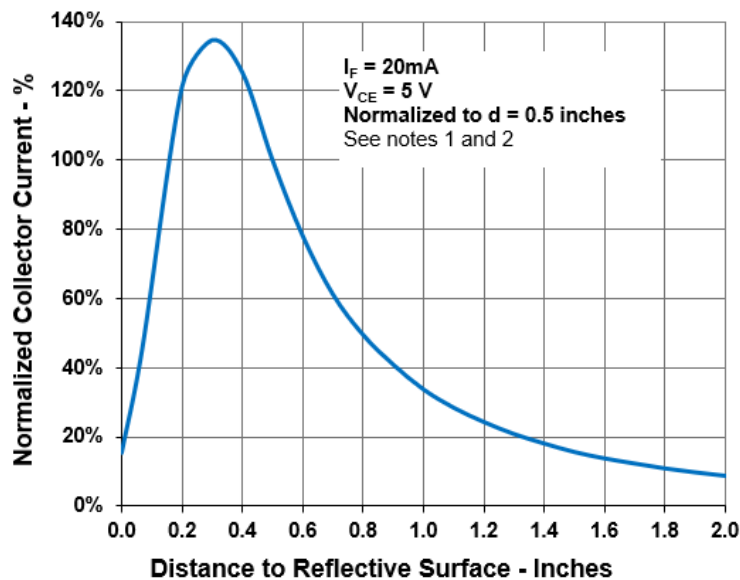
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Typical Performance Curves

LED Forward Voltage vs I_F vs Temp



Normalized Collector Current Vs Object Distance

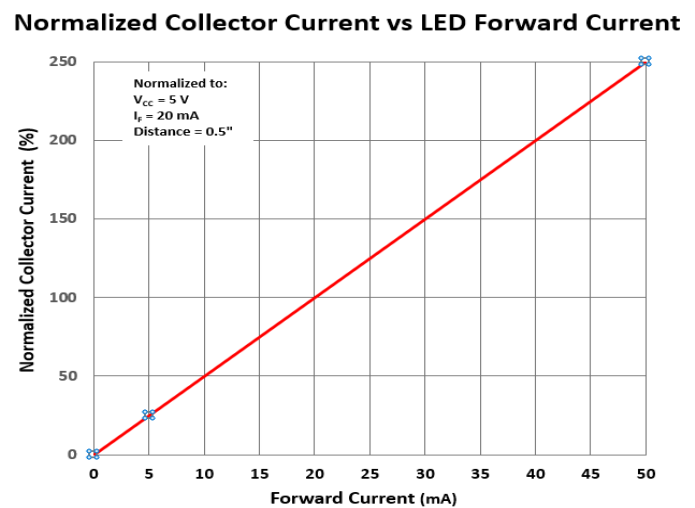
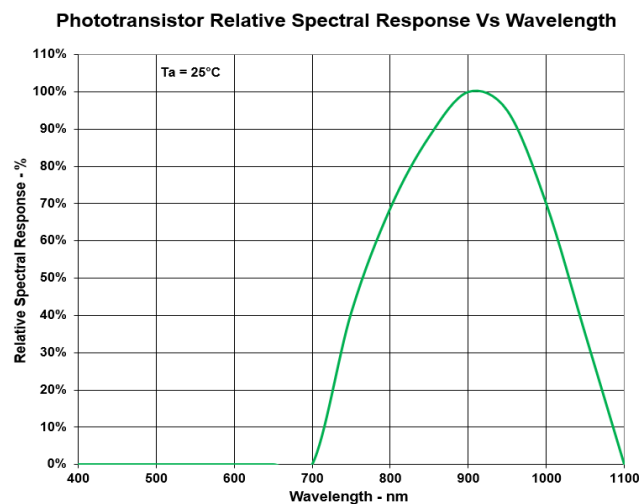
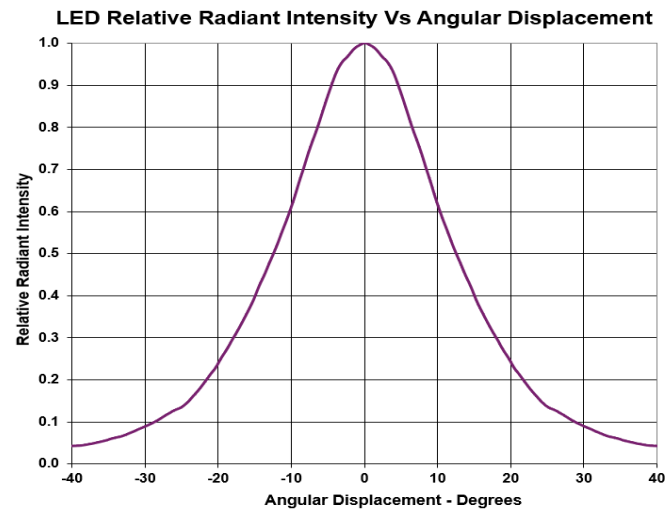
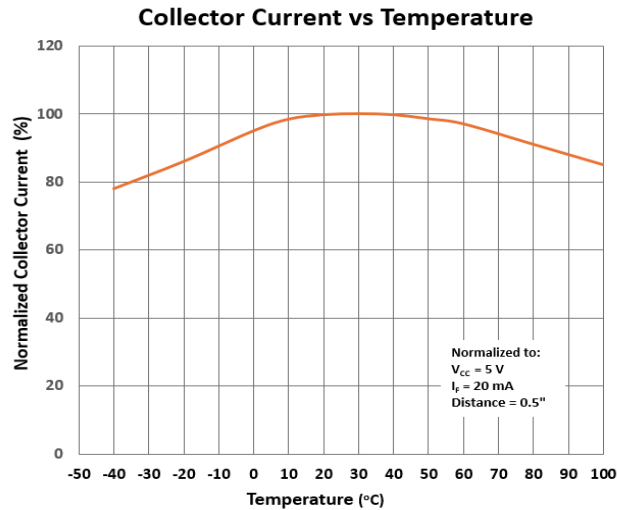


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Typical Performance Curves



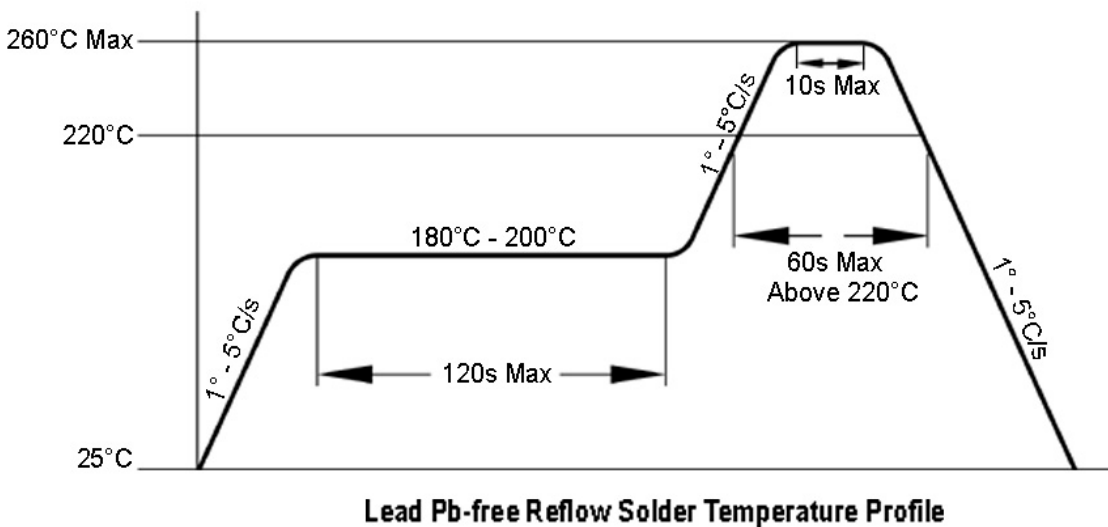
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Soldering Method:

- Reflow soldering profile shown below. Soldering should not exceed this curve in temperature and time.
- Avoid soldering more than once.
- Avoid exerting any type of pressure on the optical lenses and contact leads before, during, and after soldering.



Storage:

- Storage temperature and relative humidity (R.H.) conditions are: 5° C to 30° C and 70% R.H. or less.
- Moisture proof bag should be open only if devices are ready to be used. Devices should be utilized within 72 hours after package has been opened.
- After opening the package, devices should be kept at a temperature of 5° C to 30° C and 60% R.H. or less.
- If the devices have exceeded the storage time or the humidity card indicates 60% relative humidity level, all devices should go through a baking treatment outside the original package prior to usage. Baking treatment: 60° C +/- 5° C for 24 hours.

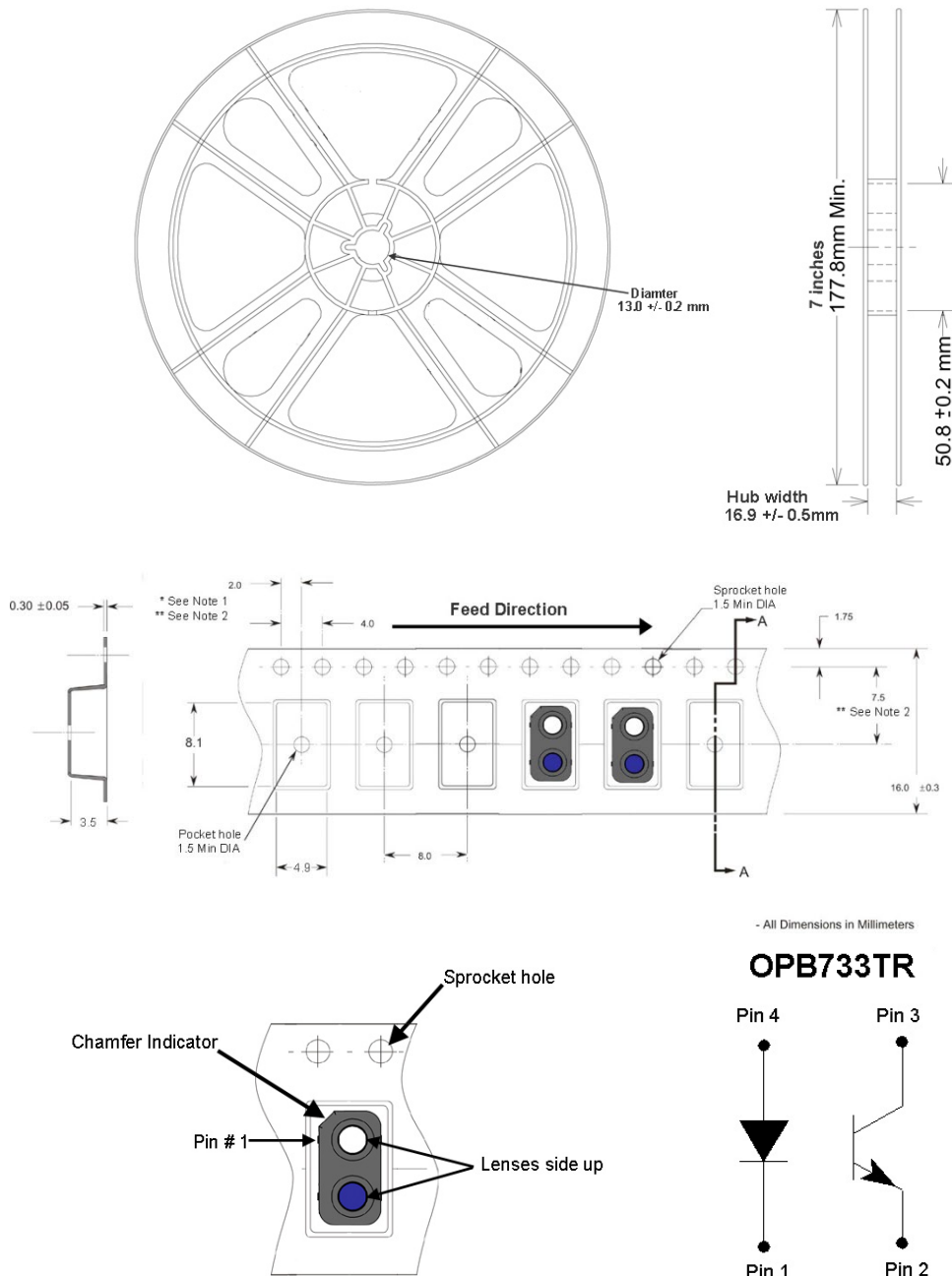
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Packaging

Tape and Reel package dimensions:



Notes:

1. * 10 sprocket hole pitch cumulative tolerance ± 0.2 mm.
2. ** Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.
3. Tolerances: ± 0.1 mm, except as noted.

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