

# Reflective Object Sensor

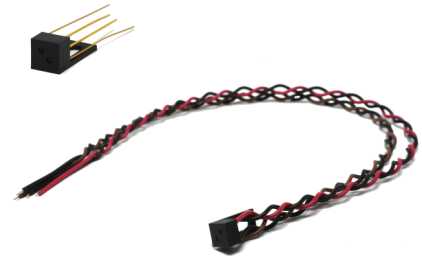


OPB735A, OPB735B, OPB735C

OPB735AWZ, OPB735BWZ, OPB735CWZ

## Features:

- Choice of phototransistor or photodarlington output
- Unfocused for sensing diffuse surfaces
- Non-conductive plastic housing
- Low profile to facilitate stacking
- #28 AWG lead wire in 12" ( 300 mm) length



## Description:

The **OPB735** series sensors consist of an infrared light emitting diode and an NPN silicon phototransistor or photodarlington, encased side-by-side on converging optical axes in a black thermoplastic housing.

The detector responds to light from the IRED only when a reflective object passes within its field of view.

The **OPB735** series employs hermetically sealed metal can packaged components.

The **OPB735X** series has 4 leads . The **OPB735XWZ** series has interconnect wires at 12" (300 mm) length UL 1569 approved #28 AWG, stripped and tinned.

Custom electrical, wire, cabling and connectors are available. Contact your local TT Electronics—OPTEK representative for more information.

## Applications:

- Non-contact reflective object sensor
- Assembly line automation
- Machine automation
- Machine safety
- End of travel sensor
- Door sensor
- Compatible with Honeywell HOA1180 and HOA2498

Ordering Information				
Part Number	LED Peak Wavelength	Sensor	Nominal reflection distance Inch (mm)	Lead Length/ Wire length
OPB735A	890 nm	Transistor	0.50" (12.7 mm)	0.9"
OPB735B				
OPB735C		Darlington		
OPB735AWZ		Transistor		12" / 28 AWG Wire
OPB735BWZ				
OPB735CWZ		Darlington		

### General Note

TT Electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

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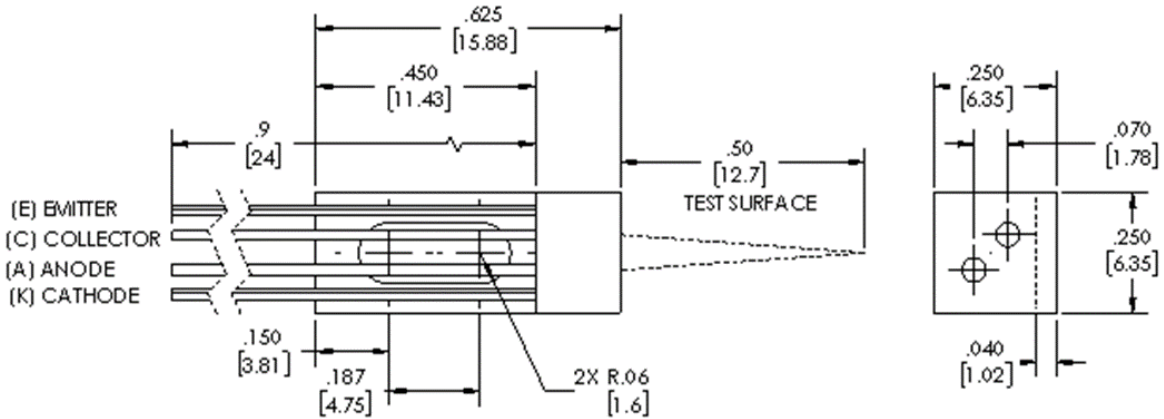
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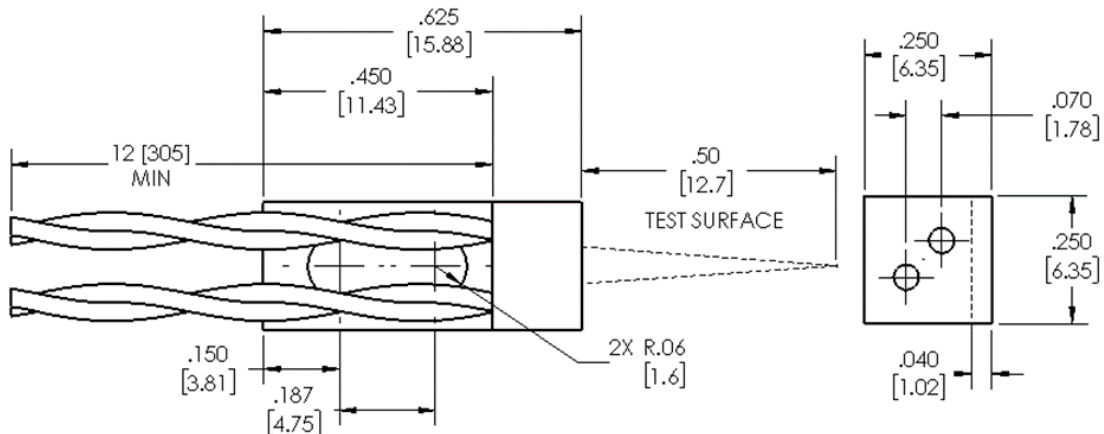
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## OPB735A, OPB735B, OPB735C



## OPB735AWZ, OPB735BWZ, OPB735CWZ



OPB735*WZ	Wire Color Code
LED anode	Red
LED cathode	Black
Collector	
OPB735AWZ	Brown
OPB735BWZ	Orange
OPB735CWZ	Yellow
Emitter	Black

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## Electrical Specifications

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

Operating Temperature Range	-55 °C to +100 °C
Storage Temperature Range	-55 °C to +125 °C
Soldering Temperature (5 sec) OPB735A, OPB735B, OPB735C OPB735AWZ, OPB735BWZ, OPB735CWZ	260 °C 240 °C
<b>Input Diode</b>	
Continuous Forward Current	75 mA
Reverse Voltage	2 V
Power Dissipation <sup>(1)</sup>	100 mW
<b>Output Phototransistor</b> (OPB735A, OPB735B, OPB735AWZ, OPB735BWZ) <b>Output Photodarlington</b> (OPB735C, OPB735CWZ)	
Collector-Emitter Voltage OPB735A, OPB735B, OPB735AWZ, OPB735BWZ OPB735C, OPB735CWZ	30 V 15 V
Emitter-Collector Voltage	5 V
Collector DC Current	30 mA
Power Dissipation <sup>(1)</sup>	75 mW

Note:

(1) Derate linearly 1.25 mW/°C above 25 °C

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## Electrical Specifications

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

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
<b>Input Diode</b>						
$V_F$	Forward Voltage	-	-	1.80	V	$I_F = 50\text{ mA}$
$I_R$	Reverse Current	-	-	100	$\mu\text{A}$	$V_R = 2\text{ V}$
<b>Output Phototransistor (OPB735A, OPB735B, OPB735AWZ, OPB735BWZ)</b>						
$V_{(BR)CEO}$	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	$V_{CE} = 10\text{ V}, I_F = 0\text{ }^{(4)}$
<b>Output Photodarlington (OPB735C, OPB735CWZ)</b>						
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	15	-	-	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	-	-	250	nA	$V_{CE} = 10\text{ V}, I_F = 0\text{ }^{(4)}$
<b>Coupled</b>						
$V_{CE(SAT)}$	Saturation Voltage OPB735A, OPB735AWZ OPB735B, OPB735BWZ OPB735C, OPB735CWZ	- - -	- - -	0.40 0.40 1.10	V	$I_F = 30\text{ mA}, I_C = 5\text{ }\mu\text{A}^{(1)}$ $I_F = 30\text{ mA}, I_C = 20\text{ }\mu\text{A}^{(1)}$ $I_F = 30\text{ mA}, I_C = 250\text{ }\mu\text{A}^{(1)}$
$I_{C(ON)}$	On-State Collector Current OPB735A, OPB735AWZ OPB735B, OPB735BWZ	0.04 0.16	- -	- -	mA	$V_{CE} = 5\text{ V}, I_F = 30\text{ mA}, ^{(1)}$
$I_{C(ON)}$	OPB735C, OPB735CWZ	2.0	-	-	mA	$V_{CE} = 5\text{ V}, I_F = 20\text{ mA}, ^{(1)}$
$t_r, t_f$	Rise And Fall Time OPB735A, OPB735AWZ <sup>(2)</sup> OPB735B, OPB735BWZ <sup>(2)</sup> OPB735C, OPB735CWZ <sup>(3)</sup>		15 15 250		$\mu\text{s}$	$V_{CC} = 5\text{ V}, V_L = 1\text{ V}, R_L = 1000\text{ }\Omega$

Note:

- (1) Test surface is a front surface mirror (polished aluminum, 85% reflectance) located 0.50 in.(12.7 mm) from the front surface of the device.
- (2) Tested with a pulsed LED at 1 KHz
- (3) Tested with a pulsed LED at 100 Hz
- (4) To calculate typical collector dark current in nA , use the formula  $I_{CEO} = 10^{(0.040T_A - 3.4)}$  where  $T_A$  is ambient temperature in  $^\circ\text{C}$

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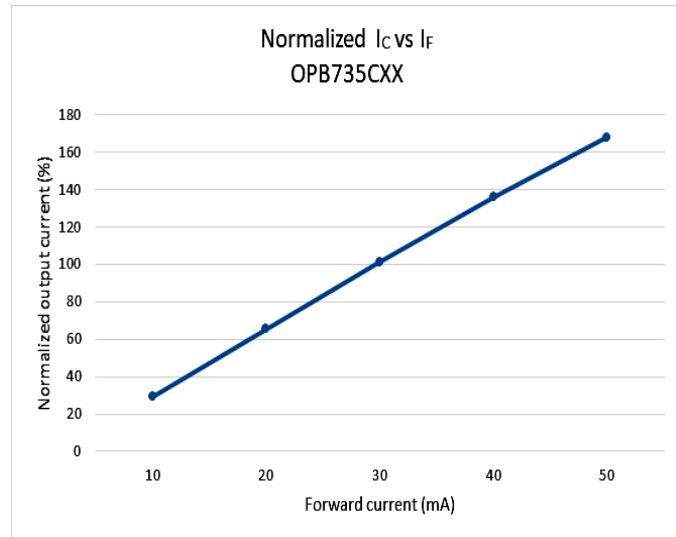
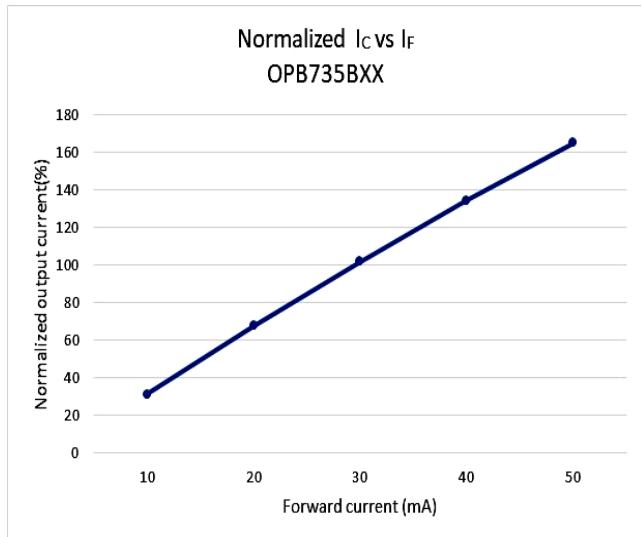
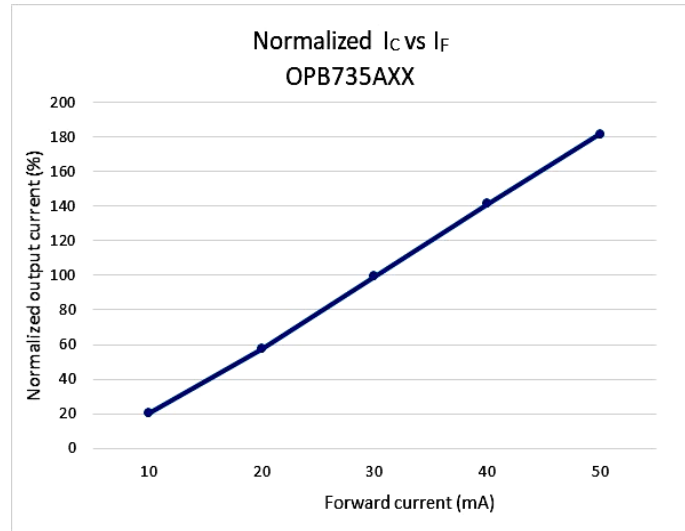
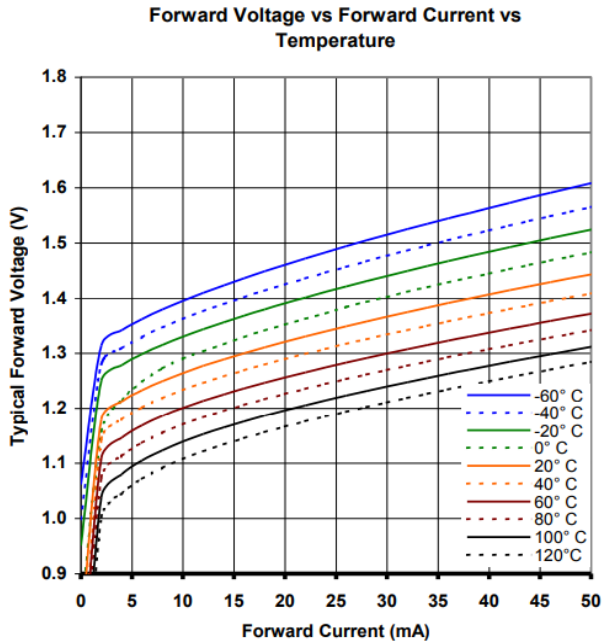
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## Performance



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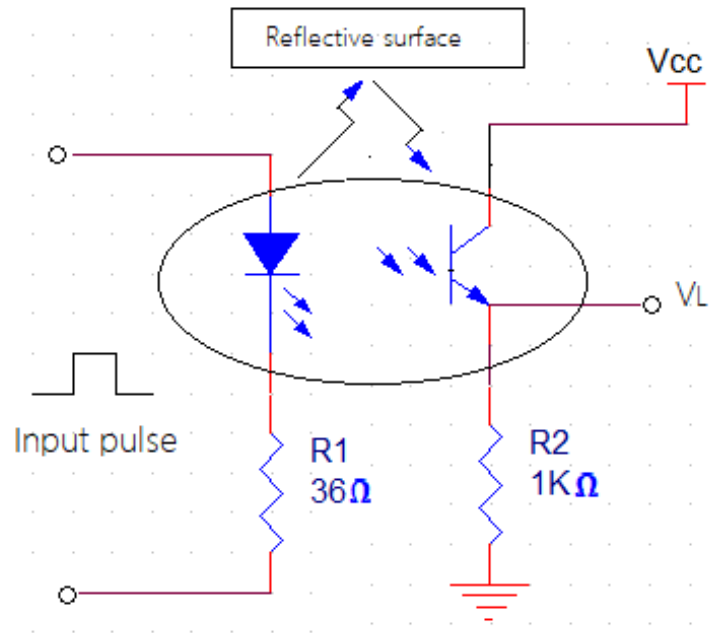
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## Switching Time Circuit



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