

Reflective Object Sensor

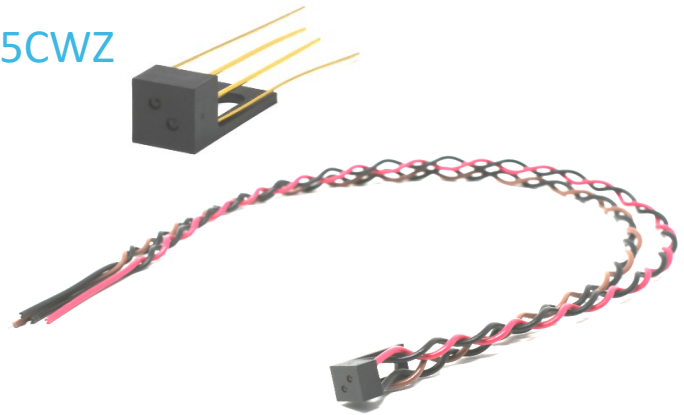
OPB735A, OPB735B, OPB735C

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

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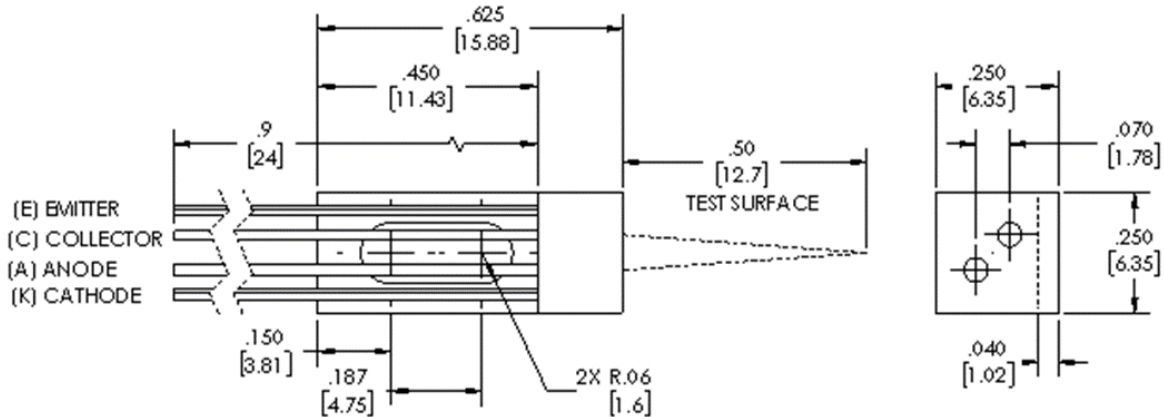
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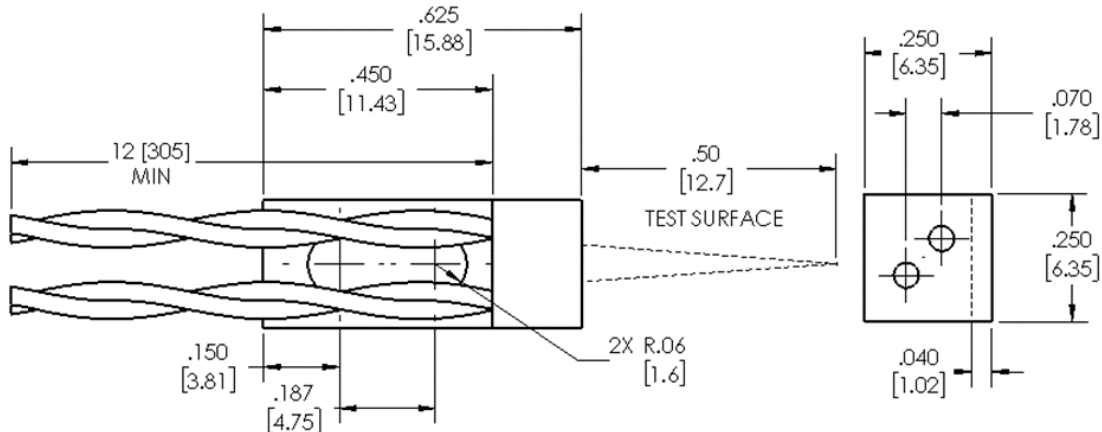
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OPB735*WZ	Wire Color Code
LED anode	Red
LED cathode	Black
Collector OPB735AWZ OPB735BWZ OPB735CWZ	Brown Orange Yellow
Emitter	Black

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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
Input Diode	
Continuous Forward Current	75 mA
Reverse Voltage	2 V
Power Dissipation ⁽¹⁾	100 mW
Output Phototransistor (OPB735A, OPB735B, OPB735AWZ, OPB735BWZ) Output Photodarlington (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 ⁽¹⁾	75 mW

Note:

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

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Electrical Specifications

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	-	-	1.80	V	$I_F = 50\text{ mA}$
I_R	Reverse Current	-	-	100	μA	$V_R = 2\text{ V}$
Output Phototransistor (OPB735A, OPB735B, OPB735AWZ, OPB735BWZ)						
$V_{(BR)CEO}$	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	$V_{CE} = 10\text{ V}, I_F = 0^{(4)}$
Output Photodarlington (OPB735C, OPB735CWZ)						
$V_{(BR)CEO}$	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	$V_{CE} = 10\text{ V}, I_F = 0^{(4)}$
Coupled						
$V_{CE(SAT)}$	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 ⁽²⁾ OPB735B, OPB735BWZ ⁽²⁾ OPB735C, OPB735CWZ ⁽³⁾		15 15 250		μs	$V_{CC} = 5\text{ V}, V_L = 1\text{ V}, R_L = 1000\text{ }\Omega$

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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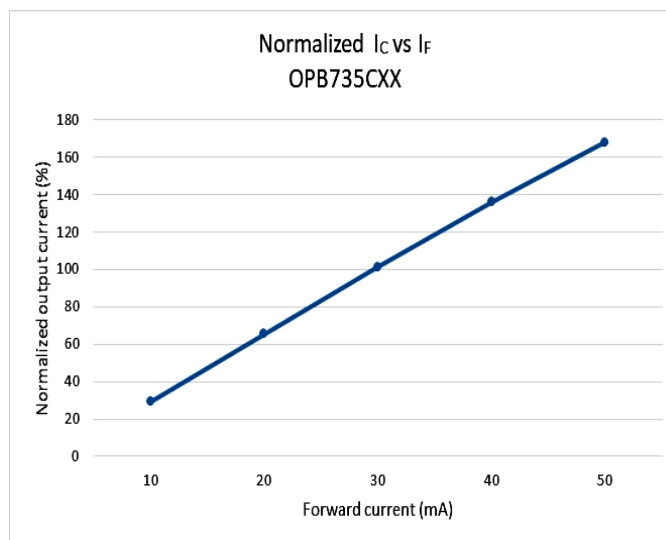
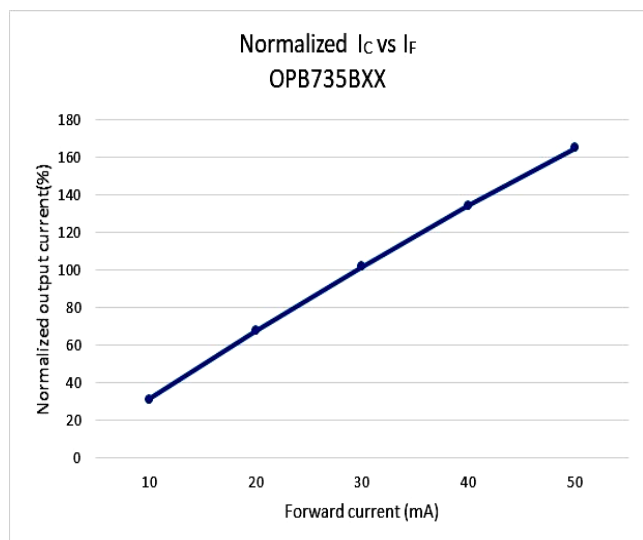
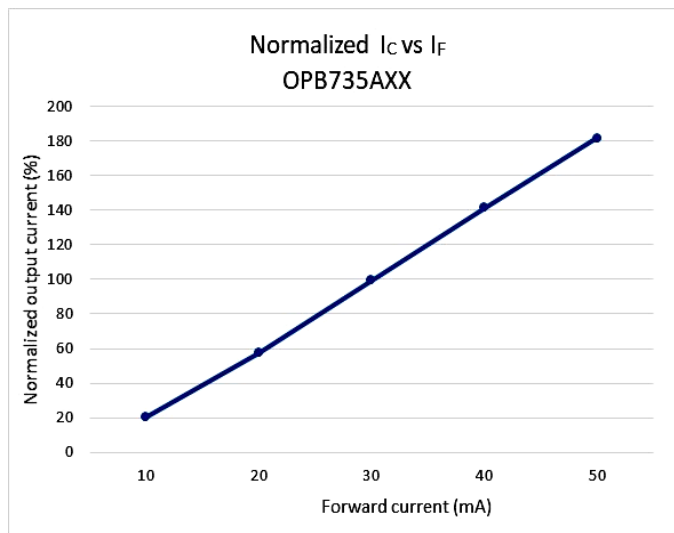
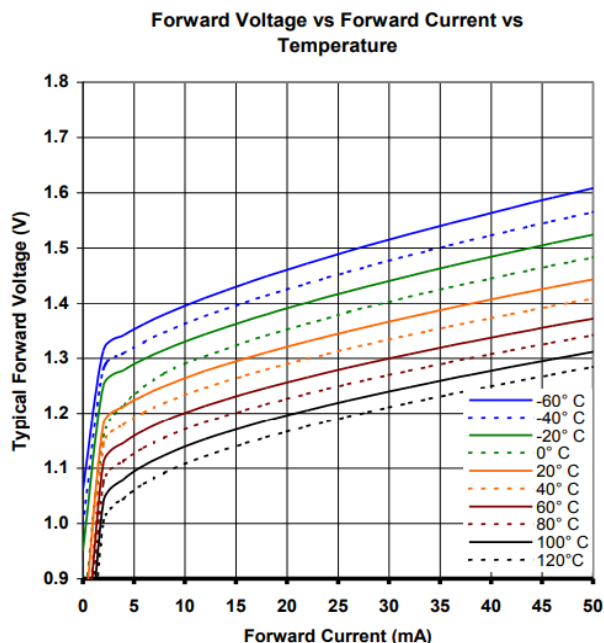
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Performance



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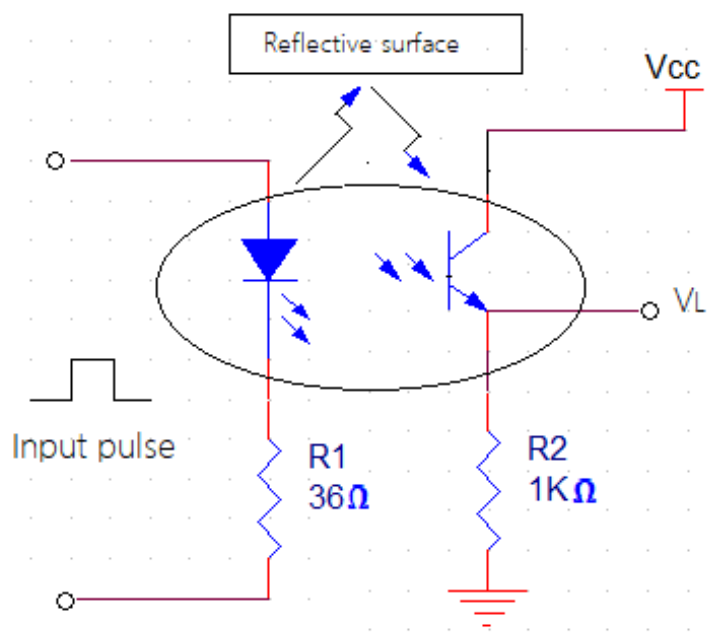
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Switching Time Circuit



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