

# Reflective Object Sensor

OPB708, OPB709,  
OPB740 Series, OPB740WZ Series



Absolute Maximum Ratings ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)	
Operating and Storage Temperature Range OPB708, OP709, OPB740, OPB741, OPB742, OPB743, OPB744, OPB745	-40 °C to +85 °C
OPB741WZ, OPB742WZ, OPB743WZ, OPB744WZ, OPB745WZ, OPB746WZ, OPB747WZ, OPB748WZ	-40 °C to +80 °C
Lead Soldering Temperature [1/16 inch (1.6mm) from the case for 5 sec. with soldering iron] <sup>(1)</sup>	260 °C
<b>Input Diode</b> (See OP165 (935 nm), OP265 (890 nm) or OVLAS6CB8 (645 nm) for additional information)	
Forward DC Current	40 mA
Reverse DC Voltage	2 V
Power Dissipation <sup>(2)</sup>	100 mW
<b>Sensor Output</b> (See OP505 (Transistor), OP705 ( $R_{BE}$ Transistor) or OP535 (Darlington) for additional Information)	
Collector-Emitter Voltage OPB708 OPB709 OPB740, OPB741, OPB742, OPB743, OPB744 OPB740WZ, OPB741WZ, OPB742WZ, OPB743WZ, OPB744WZ OPB748WZ OPB745 OPB745WZ OPB746WZ, OPB747WZ	30 V 15 V 30 V 30 V 15 V 15 V 24 V
Emitter-Collector Voltage OPB708 through OPB745, OPB748 OPB746 through OPB747	5.0 V 0.4 V
Power Dissipation <sup>(2)</sup>	100 mW

Notes:

1. RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering.
2. Derate linearly 1.33 Mw °C above 25 °C.

Electrical Characteristics ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)						
SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
<b>645 nm LED</b> (See OVLAS6CB8 for generic information — for reference only)						
$V_F$	Forward Voltage	-	-	2.6	V	$I_F = 20\text{ mA}$
$I_R$	Reverse Current	-	-	100	$\mu\text{A}$	$V_R = 2\text{ V}$
<b>890 nm LED</b> (See OP265 for additional information — for reference only)						
$V_F$	Forward Voltage	-	-	1.8	V	$I_F = 40\text{ mA}$
$I_R$	Reverse Current	-	-	100	$\mu\text{A}$	$V_R = 2\text{ V}$
<b>935 nm LED</b> (See OP165 for additional information — for reference only)						
$V_F$	Forward Voltage	-	-	1.7	V	$I_F = 40\text{ mA}$
$I_R$	Reverse Current	-	-	100	$\mu\text{A}$	$V_R = 2\text{ V}$

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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## OPB708, OPB709, OPB740 Series, OPB740WZ Series



Electrical Characteristics (T <sub>A</sub> = 25 °C unless otherwise noted)						
SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
<b>Output R<sub>BE</sub> Phototransistor</b> (See OP705 for general information — for reference only)						
V <sub>(BR)CEO</sub>	Collector-Emitter Breakdown Voltage	24	-	-	V	I <sub>C</sub> = 100 μA
I <sub>CEO</sub>	Collector Dark Current	-	-	100	nA	V <sub>CE</sub> = 10 V, I <sub>F</sub> = 0, E <sub>E</sub> = 0
<b>Output Phototransistor</b> (See OP505 for general information — for reference only)						
V <sub>(BR)CEO</sub>	Collector-Emitter Breakdown Voltage	30	-	-	V	I <sub>C</sub> = 100 μA
V <sub>(BR)ECO</sub>	Emitter-Collector Breakdown Voltage	5	-	-	V	I <sub>E</sub> = 100 μA
I <sub>CEO</sub>	Collector Dark Current	-	-	100	nA	V <sub>CE</sub> = 10 V, I <sub>F</sub> = 0, E <sub>E</sub> = 0
<b>Output Photodarlington</b> (See OP535 for general information — for reference only)						
V <sub>(BR)CEO</sub>	Collector-Emitter Breakdown Voltage	15	-	-	V	I <sub>C</sub> = 100 μA
V <sub>(BR)ECO</sub>	Emitter-Collector Breakdown Voltage	5	-	-	V	I <sub>E</sub> = 100 μA
I <sub>CEO</sub>	Collector-Emitter Dark Current OPB709, OPB745, OPB745WZ	-	-	25	μA	V <sub>CE</sub> = 5 V, I <sub>F</sub> = 0, E <sub>E</sub> = 0
<b>Coupled</b>						
V <sub>CE(SAT)</sub>	Saturation Voltage OPB708 OPB709 OPB745, OPB745WZ	- - -	- - -	0.40 1.10 1.10	V	I <sub>F</sub> = 40 mA, I <sub>C</sub> = 3 μA, d = 0.15 <sup>”(1)(2)</sup> I <sub>F</sub> = 40 mA, I <sub>C</sub> = 3 μA, d = 0.15 <sup>”(1)(2)</sup> I <sub>F</sub> = 40 mA, I <sub>C</sub> = 400 μA, d = 0.15 <sup>”(1)(2)</sup>
I <sub>C(ON)</sub> <sup>(1)(2)</sup>	On-State Collector Current OPB708 OPB709 OPB740, OPB740WZ OPB741, OPB741W Z OPB742, OPB742WZ OPB743, OPB743WZ OPB744, OPB744WZ OPB745, OPB745WZ OPB746WZ OPB747WZ OPB748WZ	0.01 1.00 0.05 0.05 0.01 0.20 0.20 5.00 0.50 0.01 0.01	- - - - - - - - - - -	3.00 - 2.50 2.50 0.70 2.00 2.00 26.0 2.50 0.70 0.70	mA	V <sub>CE</sub> = 5 V, I <sub>F</sub> = 40 mA, d = 0.15 <sup>”(3.810 mm)</sup>
I <sub>CX</sub> <sup>(3)</sup>	Crosstalk OPB708, OPB709, OPB740, OPB740WZ OPB741, OPB741WZ OPB742, OPB742WZ OPB743, OPB743WZ OPB744, OPB744WZ OPB745, OPB745WZ OPB746WZ OPB747WZ OPB748WZ	- - - - - - - - - - -	- - - - - - - - - - -	- 10.0 10.0 1.0 20.0 20.0 25.0 1.0 1.0 1.0	μA	V <sub>CC</sub> = 5 V, I <sub>F</sub> = 40 mA

**Notes:**

- The distance from the assembly face to the reflective surface is “d”.
- Reflective surface is Eastman Kodak (Catalog #190 3061) neutral white test card with 90% diffuse reflectance as a reflecting surface.
- Crosstalk is the photocurrent measured with current to the input diode, no reflective surface and no ambient light (E<sub>E</sub> = 0).

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