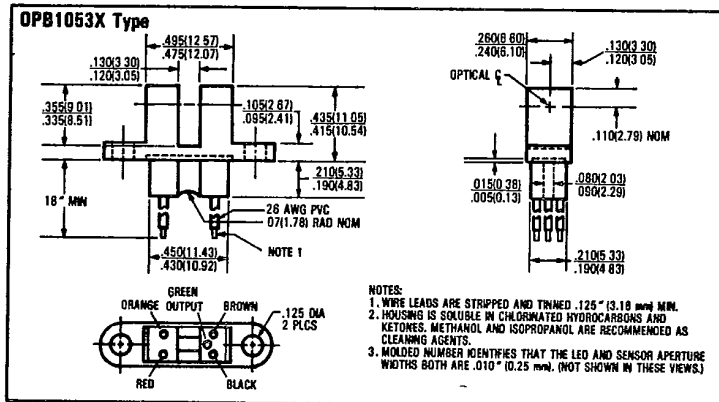
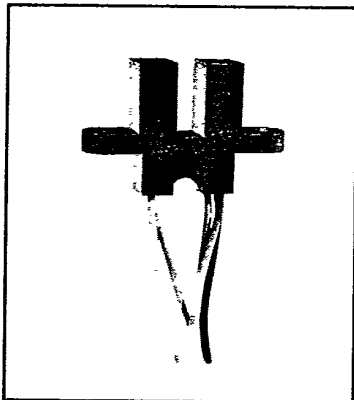
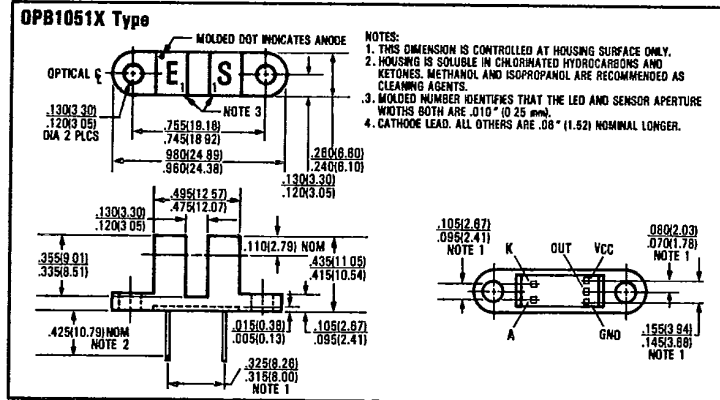
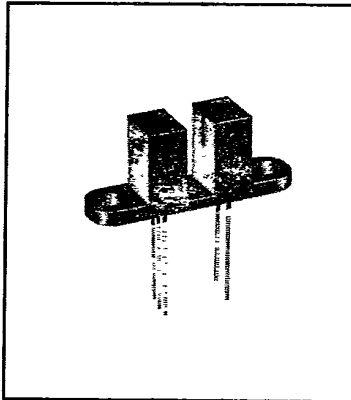


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# Photologic™ Slotted Optical Switches

## Type OPB10500 Series



**Features**

- Choice of output configuration
- Polysulfone housing
- Data rates to 250K baud
- High resolution

**Description**

The all new OPB10500 series is intended to provide custom design capabilities in a standard series. Each device consists of an infrared emitting diode and a Photologic™ integrated circuit mounted on opposite sides of a 0.125" (3.18 mm) wide slot. Photologic™ sensor/LED aperture width of 0.010" (0.25 mm); dual flange mounting configuration; buffer totem-pole, buffer open-collector, inverter totem-pole or inverter open-collector output; and polysulfone housing for dirt and dust protection. Available with either discrete leads or wire leads (26 ga., 18" in length).

**Absolute Maximum Ratings (T<sub>A</sub> = 25°C unless otherwise noted)**

Supply Voltage, VCC (not to exceed 3 seconds)	+10 V
Storage Temperature Range	-40°C to +85°C
Operating Temperature Range	-40°C to +70°C
Lead Soldering Temperature (1/16 inch [1.6 mm] from case for 5 sec. with soldering iron)	240°C(1)
Input Diode Power Dissipation	100 mW(2)
Output Photologic Power Dissipation	200 mW(4)
Total Device Power Dissipation	300 mW(6)
Voltage at Output Lead (Open-Collector Output)	35 V
Diode (Forward D.C. Current)	40 mA
Diode (Reverse D.C. Voltage)	2.0 V

**Notes:**

- (1) RMA flux is recommended. Duration can be extended to 10 sec. max. when wave soldering.
- (2) Derate linearly 1.33 mW/°C above 25°C.
- (3) Normal application would be with light source blocked, simulated by I<sub>f</sub> = 0.
- (4) Derate linearly 2.67 mW/°C above 25°C.
- (5) Derate linearly 4.0 mW/°C above 25°C.

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Electrical Characteristics (-40°C to +70°C unless otherwise noted)

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
<b>Input Diode</b>						
V <sub>F</sub>	Forward Voltage			1.70	V	I <sub>F</sub> = 20 mA, T <sub>A</sub> = 25°C
I <sub>R</sub>	Reverse Current			100	μA	V <sub>R</sub> = 2.0 V, T <sub>A</sub> = 25°C
<b>Output Photologic™</b>						
V <sub>CC</sub>	Operating Supply Voltage	4.75		5.25	V	
I <sub>CC(L)</sub>	Low Level Supply Current: Buffer with Totem-Pole Output Buffer with Open-Collector Inverter with Totem-Pole Output Inverter with Open-Collector			15.0 15.0 15.0 15.0	mA mA mA mA	V <sub>CC</sub> = 5.25 V, I <sub>F</sub> = 0 mA <sup>(3)</sup> V <sub>CC</sub> = 5.25 V, I <sub>F</sub> = 0 mA <sup>(3)</sup> V <sub>CC</sub> = 5.25 V, I <sub>F</sub> = 25 mA V <sub>CC</sub> = 5.25 V, I <sub>F</sub> = 25 mA
I <sub>CC(H)</sub>	High Level Supply Current: Buffer with Totem-Pole Buffer with Open-Collector Inverter with Totem-Pole Inverter with Open-Collector			15.0 15.0 15.0 15.0	mA mA mA mA	V <sub>CC</sub> = 5.25 V, I <sub>F</sub> = 25 mA V <sub>CC</sub> = 5.25 V, I <sub>F</sub> = 25 mA V <sub>CC</sub> = 5.25 V, I <sub>F</sub> = 0 mA <sup>(3)</sup> V <sub>CC</sub> = 5.25 V, I <sub>F</sub> = 0 mA <sup>(3)</sup>
V <sub>OL</sub>	Low Level Output Voltage: Buffer with Totem-Pole Buffer with Open-Collector Inverter with Totem-Pole Inverter with Open-Collector			0.4 0.4 0.4 0.4	V V V V	V <sub>CC</sub> = 4.75 V, I <sub>OL</sub> = 12.8 mA, I <sub>F</sub> = 0 mA <sup>(3)</sup> V <sub>CC</sub> = 4.75 V, I <sub>OL</sub> = 12.8 mA, I <sub>F</sub> = 0 mA <sup>(3)</sup> V <sub>CC</sub> = 4.75 V, I <sub>OL</sub> = 12.8 mA, I <sub>F</sub> = 25 mA V <sub>CC</sub> = 4.75 V, I <sub>OL</sub> = 12.8 mA, I <sub>F</sub> = 25 mA
V <sub>OH</sub>	High Level Output Voltage: Buffer with Totem-Pole Inverter with Totem-Pole	2.4 2.4			V V	V <sub>CC</sub> = 4.75 V, I <sub>OH</sub> = 800 μA, I <sub>F</sub> = 25 mA V <sub>CC</sub> = 4.75 V, I <sub>OH</sub> = 800 μA, I <sub>F</sub> = 0 mA <sup>(3)</sup>
I <sub>OH</sub>	High Level Output Current: Buffer with Open-Collector Inverter with Open-Collector			100 100	μA μA	V <sub>CC</sub> = 4.75 V, V <sub>OH</sub> = 30 V, I <sub>F</sub> = 25 mA V <sub>CC</sub> = 4.75 V, V <sub>OH</sub> = 30 V, I <sub>F</sub> = 0 mA <sup>(3)</sup> , T <sub>A</sub> = 25°C
I <sub>F(+)</sub>	LED Positive-Going Threshold Current			25	mA	V <sub>CC</sub> = 5.0 V, T <sub>A</sub> = 25°C
I <sub>F(+)</sub> /I <sub>F(-)</sub>	Hysteresis Ratio		2.0			V <sub>CC</sub> = 5.0 V
I <sub>OS</sub>	Short Circuit Output Current	-30		-100	mA	V <sub>CC</sub> = 5.25 V, I <sub>F</sub> = 25.0 mA, Output = GND
t <sub>r</sub> , t <sub>f</sub>	Output Rise Time, Output Fall Time		70		ns	V <sub>CC</sub> = 5.0 V, T <sub>A</sub> = 25°C, I <sub>F</sub> = 0 or 25 mA R <sub>L</sub> = 8 TTL Loads (Totem-Pole) R <sub>L</sub> = 360 Ω (Open-Collector)
t <sub>PLH</sub> , t <sub>PHL</sub>	Propagation Delay, Low-High & High-Low		5.0		μs	

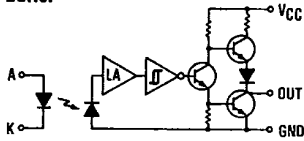


**Type OPB10500 Series**

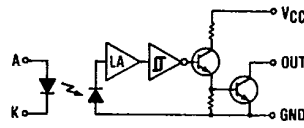
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**Schematics**

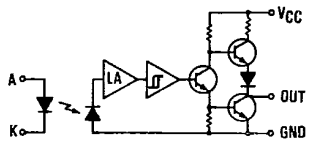
**OPB10510/OPB10530  
(Totem-Pole Output)  
Buffer**



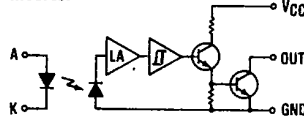
**OPB10511/OPB10531  
(Open-Collector Output)  
Buffer**



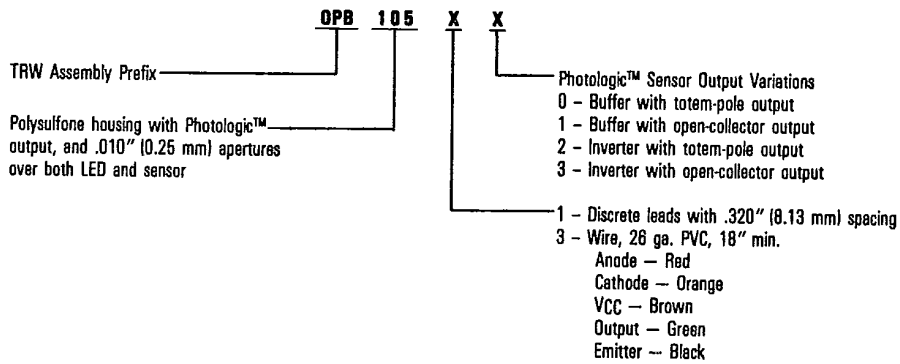
**OPB10512/OPB10532  
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Inverter**



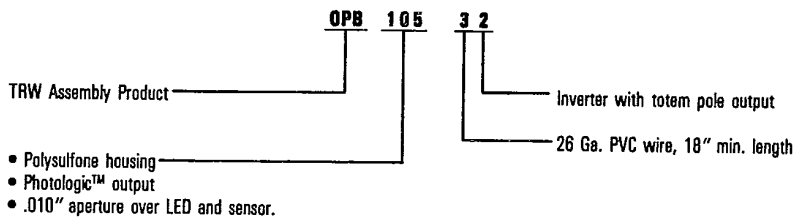
**OPB10513/OPB10533  
(Open-Collector Output)  
Inverter**



**Part Numbering Guide**



**Example**



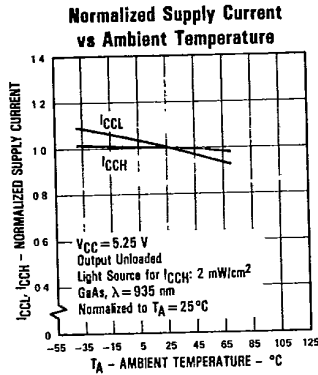
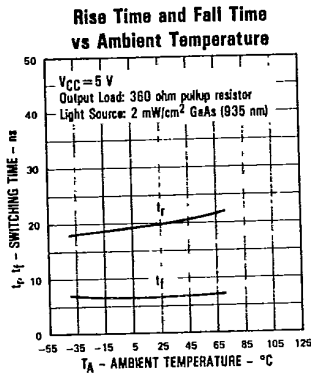
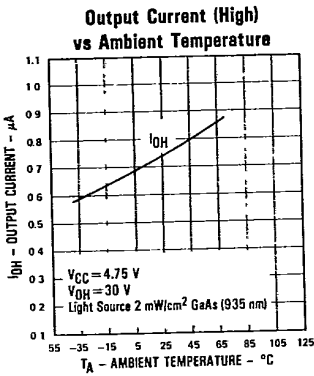
Type OPB10500 Series

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Typical Performance Curves

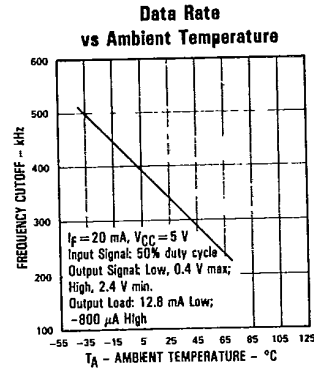
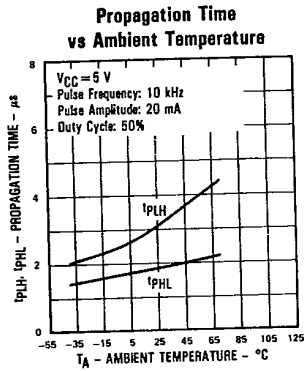
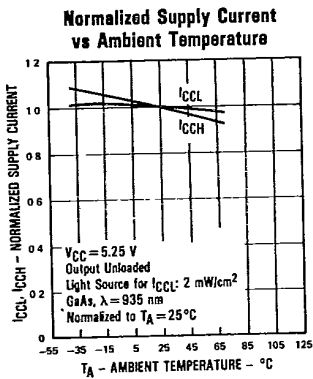
OPB10511/OPB10513/OPB10531/OPB10533

OPB10510/OPB10511/OPB10530/  
OPB10531

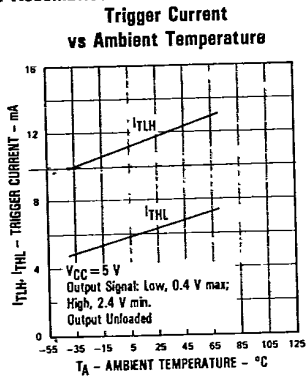


OPB10512/OPB10513/OPB10532/OPB10533

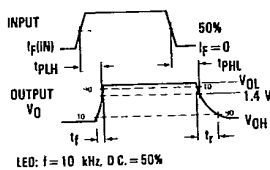
All Assemblies



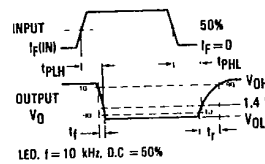
All Assemblies



Switching Test Curve for Buffers



Switching Test Curve for Inverters



TRW reserves the right to make changes at any time in order to improve design and to supply the best product possible.  
Optoelectronics Division, TRW Electronic Components Group, 1215 W. Crosby Rd., Carrollton, TX 75006 (214) 323-2200, TLX 6716032 or 215849  
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