

# Photologic® Slotted Optical Switch



OPB615, OPB616, OPB617, OPB618 Series

OPB625, OPB626, OPB627, OPB628 Series

OPB665, OPB666, OPB667, OPB668 (N and T Series)



## Features:

- Non-contact switching
- PCBoard mounting
- Enhanced signal to noise ratio
- Choice of four Logical output options

## Description:

Each OPB615, OPB625 and OPB665 series slotted optical switch consists of an 890 nm, infrared Light Emitting Diode (LED) and a monolithic integrated circuit that incorporates a photodiode, a linear amplifier and a Schmitt trigger on a single silicon chip. OPB655 offers two mounting options—no tabs (N) or two tabs (T).

All devices in this series exhibit performance over supply voltages ranging from 4.5 V to 16.0 V, and may be specified as Buffered or Inverted with 10 Kw Pull-up or Open Collector output. Devices are also TTI/LST TL compatible and can drive up to 10 TTL loads.

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

## Applications:

- Mechanical switch replacement
- Speed indication (tachometer)
- Mechanical limit indication
- Edge sensing

Ordering Information					
Part Number	Package Style	Sensor Photologic®	Aperture Emitter / Sensor	Slot Width / Depth	Lead Length / Spacing
OPB615	N	10K Pull-up	None	0.150" / 0.240"	0.100" (min) / 0.275"
OPB616		Open Collector			
OPB617		Inv-10K Pull-up			
OPB618		Inv-Open Collector			
OPB625		10K Pull-up	None	0.190" / 0.285"	0.100" (min) / 0.320"
OPB626		Open Collector			
OPB627		Inv-10K Pull-up			
OPB628		Inv-Open Collector			
OPB665N	10K Pull-up	0.05"/ 0.01"	0.125" / 0.345"		
OPB666N	Open Collector				
OPB667N	Inv-10K Pull-Up				
OPB668N	Inv-Open Collector				
OPB665T	T			10K Pull-up	
OPB666T				Open Collector	
OPB667T				Inv-10K Pull-up	
OPB668T				Inv-Open Collector	



RoHS

General Note  
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**OPB615/625/665N Buffered 10K Pull-Up**



Photologic with Pull-Up-Resistor Inverted Output



**OPB 616/626/666N Buffered Open-Collector**



Photologic with Open Collector Inverted Output



**OPB615, OPB616, OPB617, OPB618**



Pin Color/Number	Description
1	Anode
2	Cathode
3	Vcc
4	Output
5	Ground

DIMENSIONS ARE IN: [ MILLIMETERS]  
INCHES

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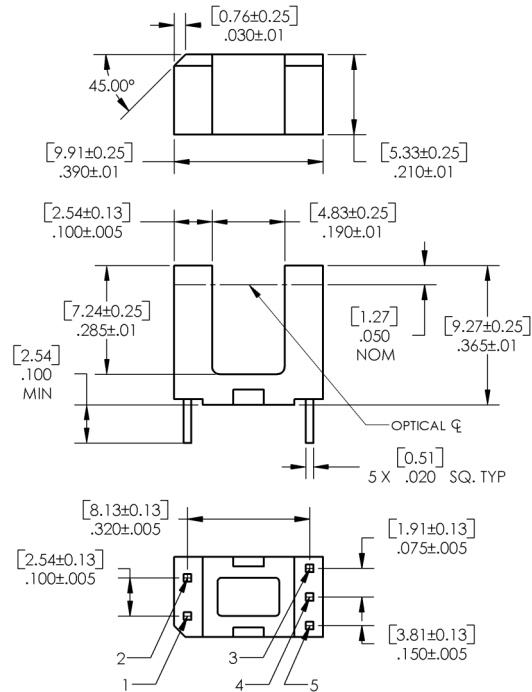
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## OPB625, OPB626, OPB627, OPB628

Pin Color/Number	Description
1	Anode
2	Cathode
3	Vcc
4	Output
5	Ground



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## OPB665, OPB666, OPB667, OPB668 (N and T)



Pin Color/Number	Description
1	Anode
2	Cathode
3	Vcc
4	Output
5	Ground

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Absolute Maximum Ratings (T <sub>A</sub> = 25° C unless otherwise noted)	
Storage & Operating Temperature Range	-40° C to +100° C
Lead Soldering Temperature (1/16 inch (1.6mm) from the case for 5 sec. with soldering iron) <sup>(1)</sup>	260° C
Input Diode	
Forward DC Current	50 mA
Peak Forward Current (1 μs pulse width, 300 pps)	3 A
Reverse DC Voltage	3 V
Power Dissipation <sup>(2)</sup>	100 mW
Output Photologic®	
Supply Voltage, V <sub>CC</sub>	18 V
Duration of Output Short to V <sub>CC</sub>	1 second
Voltage at Output <sup>(5)</sup>	V <sub>CC</sub>
Low Level Output Current (sinking)	16 mA
Power Dissipation <sup>(3)</sup>	240° 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.
- (3) Derate linearly 2.50 mW/° C above 25° C.
- (4) Normal application would be with light source blocked, simulated by I<sub>F</sub> = 0 mA.
- (5) Open Collector devices = 30 volts

Electrical Characteristics (T <sub>A</sub> = 25° C unless otherwise noted)							
SYMBOL	PARAMETER		MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Diode							
V <sub>F</sub>	Forward Voltage		-	-	1.6	V	I <sub>F</sub> = 10 mA
I <sub>R</sub>	Reverse Current		-	-	100	μA	V <sub>R</sub> = 3 V
Output Photologic® Sensor							
V <sub>CC</sub>	Operating DC Supply Voltage		4.5	-	16	V	
I <sub>F(+)</sub>	LED Positive-Going Threshold Current	OPB615-618	0.1	0.55	3	mA	V <sub>CC</sub> = 5 V
		OPB625-628	0.1	0.6	3		
		OPB665-668	0.1	1.6	10		
I <sub>F(+)</sub> /I <sub>F(-)</sub>	Hysteresis		1.05	1.20	1.90		V <sub>CC</sub> = 5 V

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Electrical Characteristics (T <sub>A</sub> = 25° C unless otherwise noted)							
SYMBOL	PARAMETER		MIN	TYP	MAX	UNITS	TEST CONDITIONS
Output Photologic® Sensor							
I <sub>CCH</sub>	High Level Supply Current: Buffer, 10k Pull-up	OPB615, 625, 665	-	5	12	mA	NO LOAD on Output <sup>(3)</sup>
	Buffer, Open-Collector	OPB616, 626, 666	-	5	12		
I <sub>CCH</sub>	Inverted, 10k Pull-up	OPB617, 627, 667	-	4	12	mA	NO LOAD on Output I <sub>F</sub> = 0 mA
	Inverted, Open-Collector	OPB618, 628, 668	-	4	12		
I <sub>CCL</sub>	Low Level Supply Current: Buffer, 10k Pull-up	OPB615, 625, 665	-	5.5	12	mA	NO LOAD on Output I <sub>F</sub> = 0 mA
	Buffer, Open-Collector	OPB616, 626, 666	-	4.0	12		
I <sub>CCL</sub>	Inverted, 10k Pull-up	OPB617, 627, 667	-	6.5	12	mA	NO LOAD on Output <sup>(3)</sup>
	Inverted, Open-Collector	OPB618, 628, 668	-	5.0	12		
V <sub>OH</sub>	High Level Output Voltage: Buffer, 10k Pull-up	OPB615, 625, 665	V <sub>CC</sub> - 1.5	-	-	V	I <sub>OH</sub> = 100 μA <sup>(3)</sup>
	Buffer, Open-Collector	OPB616, 626, 666	-	-	-		
V <sub>OH</sub>	Inverter, 10k Pull-up	OPB617, 627, 667	V <sub>CC</sub> - 1.5	-	-	V	I <sub>OH</sub> = 100 μA <sup>(1)</sup> I <sub>F</sub> = 0 mA
	Inverter, Open-Collector	OPB618, 628, 668	-	-	-		
I <sub>OH</sub>	High Level Output Voltage: Buffer, Open-Collector	OPB616, 626, 666	-	-	100	μA	V <sub>OH</sub> = 30 V <sup>(3)</sup>
	Inverter, Open-Collector	OPB618, 628, 668	-	-	100		
V <sub>OL</sub>	Low Level Output Voltage: Buffer, 10k Pull-up	OPB615, 625, 665	-	-	0.4	V	I <sub>OL</sub> = 16 mA, V <sub>CC</sub> = 4.5 V <sup>(3)(1)</sup>
	Buffer, Open-Collector	OPB616, 626, 666	-	-	0.4		
V <sub>OL</sub>	Inverter, 10k Pull-up	OPB617, 627, 667	-	-	0.4	V	I <sub>OL</sub> = 16 mA, I <sub>F</sub> = 0 mA
	Inverter, Open-Collector	OPB618, 628, 668	-	-	0.4		
t <sub>r</sub> , t <sub>f</sub>	Output Rise Time, Output Fall Time			30		ns	
t <sub>PLH</sub>	Propagation Delay, Low-High Buffer, 10k Pull-up	OPB615, 625, 665		0.6		μs	f = 10 kHz, R <sub>L</sub> = 300 Ω, DC = 50% <sup>(3)</sup>
	Buffer, Open-collector	OPB616, 626, 666		0.6			
t <sub>PLH</sub>	Inverter, 10k Pull-up	OPB617, 627, 667		3.0		μs	
	Inverter, Open-Collector	OPB618, 628, 668		3.0			
t <sub>PHL</sub>	Propagation Delay, High-Low Buffer, 10k Pull-up	OPB615, 625, 665		3.0		μs	
	Buffer, Open-collector	OPB616, 626, 666		3.0			
t <sub>PHL</sub>	Inverter, 10k Pull-up	OPB617, 627, 667		0.6		μs	
	Inverter, Open-Collector	OPB618, 628, 668		0.6			
Data Rate			-	100	-	kHz	R <sub>L</sub> = 300 Ω, DC = 50% <sup>(4)</sup>

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**OPB615 - Flag next to Emitter**



**OPB615 - Flag next to Sensor**



**OPB615 - Flag in Middle of Slot**



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**OPB625 - Flag Next to Emitter**



**OPB625 - Flag Next to Sensor**



**OPB625 - Flag in Middle of Slot**



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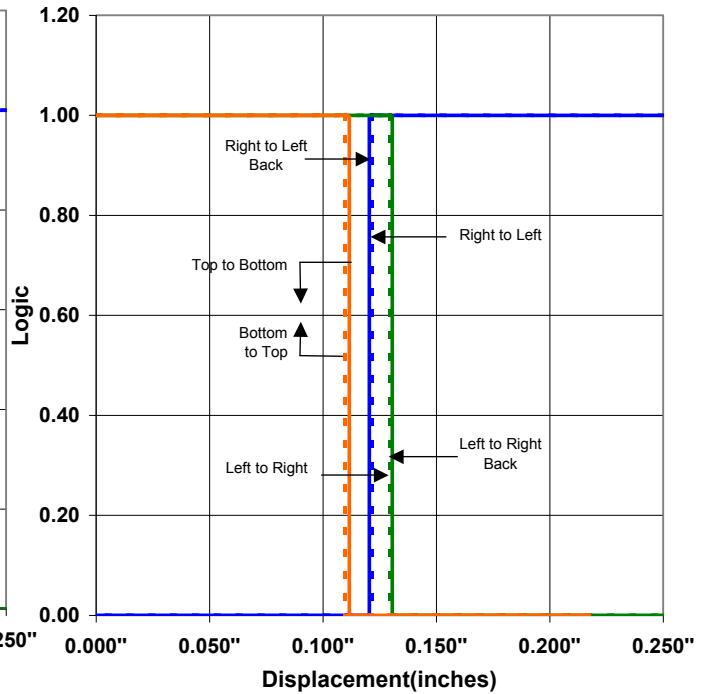
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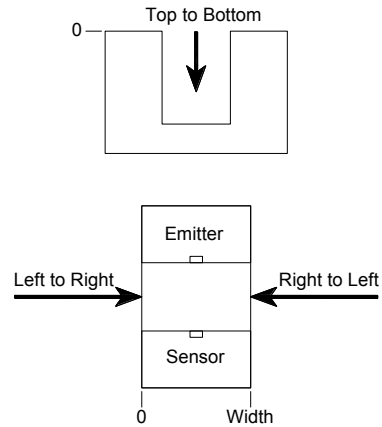
**OPB665 - Flag next to Emitter**



**OPB665 - Flag next to Sensor**



**OPB665 - Flag in Middle of Slot**



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