



# THE DATASHEET OF OPB666N

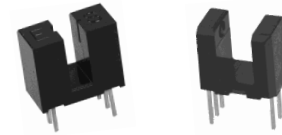


# Photologic® Slotted Optical Switch

OPB615, OPB616, OPB618 Series

OPB625, OPB626, OPB627, OPB628 Series

OPB665N, OPB666N, OPB667N 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.

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 Obsolete		Inv-10k Pull-up					
OPB618		Inv-Open Collector					
OPB625	N	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	N	10k Pull-up	0.05" / 0.01"	0.125" / 0.345"		0.100" (min) / 0.320"	
OPB666N		Open Collector					
OPB667N		Inv-10k Pull-Up					
OPB668N Obsolete		Inv-Open Collector					
OPB665T Obsolete	T	10k Pull-up	0.05" / 0.01"	0.125" / 0.345"			0.100" (min) / 0.320"
OPB666T Obsolete		Open Collector					
OPB667T Obsolete		Inv-10k Pull-up					
OPB668T Obsolete		Inv-Open Collector					



General Note  
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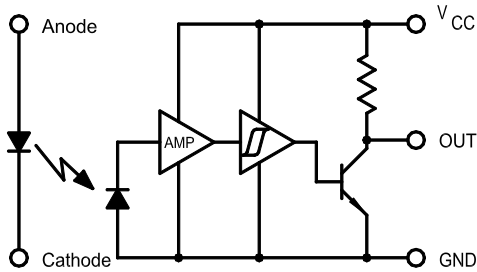
OPB615, OPB616, OPB618 Series

OPB625, OPB626, OPB627, OPB628 Series

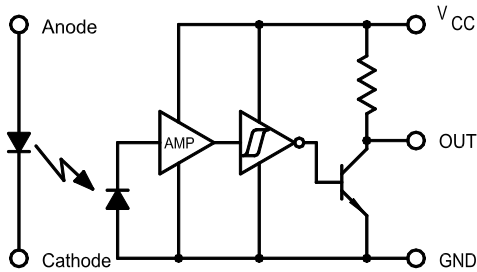
OPB665N, OPB666N, OPB667N Series



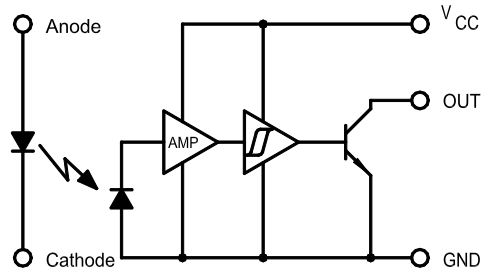
## OPB615/625/665N Buffered 10 K Pull-Up



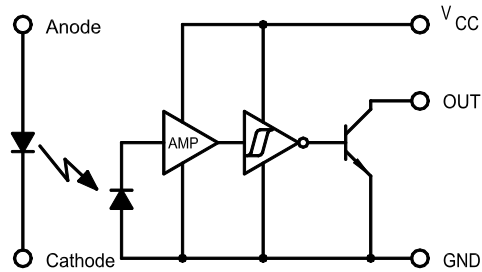
Photologic with Pull-Up-Resistor Inverted Output



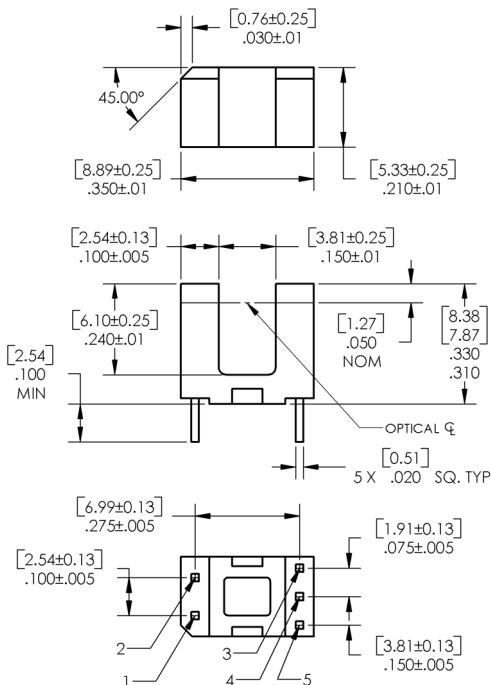
## OPB616/626/666N Buffered Open-Collector



Photologic with Open Collector Inverted Output



## OPB615, OPB616, OPB618



Pin Color/ Number	Description
1	Anode
2	Cathode
3	V <sub>CC</sub>
4	Output
5	Ground

DIMENSIONS ARE IN: [MILLIMETERS]  
INCHES

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OPB615, OPB616, OPB618 Series

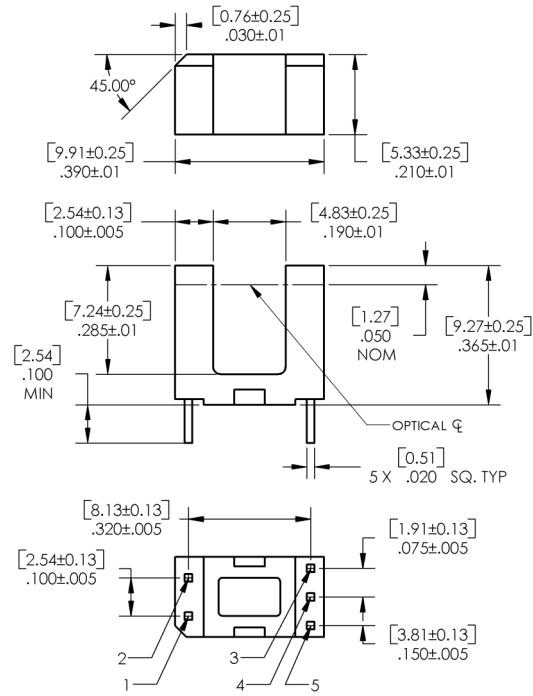
OPB625, OPB626, OPB627, OPB628 Series

OPB665N, OPB666N, OPB667N Series



## OPB625, OPB626, OPB627, OPB628

Pin Color/ Number	Description
1	Anode
2	Cathode
3	V <sub>CC</sub>
4	Output
5	Ground



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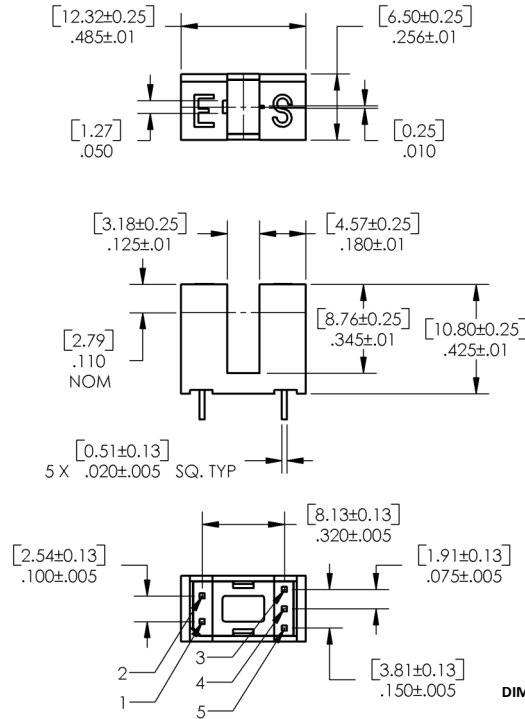
OPB615, OPB616, OPB618 Series

OPB625, OPB626, OPB627, OPB628 Series

OPB665N, OPB666N, OPB667N Series



## OPB665N, OPB666N, OPB667N



DIMENSIONS ARE IN:

[MILLIMETERS]  
INCHES

Pin Color/ Number	Description
1	Anode
2	Cathode
3	V <sub>CC</sub>
4	Output
5	Ground

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OPB665N, OPB666N, OPB667N Series



## 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 (1.6 mm) from the case for 5 sec. with soldering iron) <sup>(1)</sup>	260° C
<b>Input Diode</b>	
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
<b>Output Photologic®</b>	
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
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### 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	0.1	0.55	3	mA	V <sub>CC</sub> = 5 V
		0.1	0.6	3		
		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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OPB665N, OPB666N, OPB667N Series



## Electrical Characteristics (T<sub>A</sub> = 25° C unless otherwise noted)

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS	
<b>Output Photologic® Sensor</b>							
I <sub>CCH</sub>	High Level Supply Current: Buffer, 10k Pull-up Buffer, Open-Collector	OPB615, 625, 665 OPB616, 626, 666	- -	5 5	12 12	mA	NO LOAD on Output <sup>(3)</sup>
	Inverted, 10k Pull-up Inverted, Open-Collector	OPB627, 667 OPB618, 628	- -	4 4	12 12	mA	NO LOAD on Output I <sub>F</sub> = 0 mA
I <sub>CCL</sub>	Low Level Supply Current: Buffer, 10k Pull-up Buffer, Open-Collector	OPB615, 625, 665 OPB616, 626, 666	- -	5.5 4.0	12 12	mA	NO LOAD on Output I <sub>F</sub> = 0 mA
	Inverted, 10k Pull-up Inverted, Open-Collector	OPB627, 667 OPB618, 628	- -	6.5 5.0	12 12	mA	NO LOAD on Output <sup>(3)</sup>
V <sub>OH</sub>	High Level Output Voltage: Buffer, 10k Pull-up Buffer, Open-Collector	OPB615, 625, 665 OPB616, 626, 666	V <sub>CC</sub> - 1.5	- -	- -	V	I <sub>OH</sub> = 100 μA <sup>(3)</sup>
	Inverter, 10k Pull-up Inverter, Open-Collector	OPB627, 667 OPB618, 628	V <sub>CC</sub> - 1.5	- -	- -	V	I <sub>OH</sub> = 100 μA <sup>(1)</sup> I <sub>F</sub> = 0 mA
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	-	-	100	μA	I <sub>F</sub> = 0 mA, V <sub>OH</sub> = 30 V <sup>(1)</sup>
V <sub>OL</sub>	Low Level Output Voltage: Buffer, 10k Pull-up Buffer, Open-Collector	OPB615, 625, 665 OPB616, 626, 666	-	-	0.4	V	I <sub>OL</sub> = 16 mA, V <sub>CC</sub> = 4.5 V <sup>(3)(1)</sup>
	Inverter, 10k Pull-up Inverter, Open-Collector	OPB627, 667 OPB618, 628	-	-	0.4	V	I <sub>OL</sub> = 16 mA, I <sub>F</sub> = 0 mA
t <sub>r</sub> , t <sub>f</sub>	Output Rise Time, Output Fall Time		-	30	-	ns	f = 10 kHz, R <sub>L</sub> = 300 Ω, DC = 50% <sup>(3)</sup>
t <sub>PLH</sub>	Propagation Delay, Low-High Buffer, 10k Pull-up Buffer, Open-collector	OPB615, 625, 665 OPB616, 626, 666	-	0.6	-	μs	
	Inverter, 10k Pull-up Inverter, Open-Collector	OPB627, 667 OPB618, 628	-	3.0	-	μs	
t <sub>PHL</sub>	Propagation Delay, High-Low Buffer, 10k Pull-up Buffer, Open-collector	OPB615, 625, 665 OPB616, 626, 666	-	3.0	-	μs	
	Inverter, 10k Pull-up Inverter, Open-Collector	OPB627, 667 OPB618, 628	-	0.6	-	μs	
Data Rate			-	100	-	kHz	R <sub>L</sub> = 300 Ω, DC = 50% <sup>(4)</sup>

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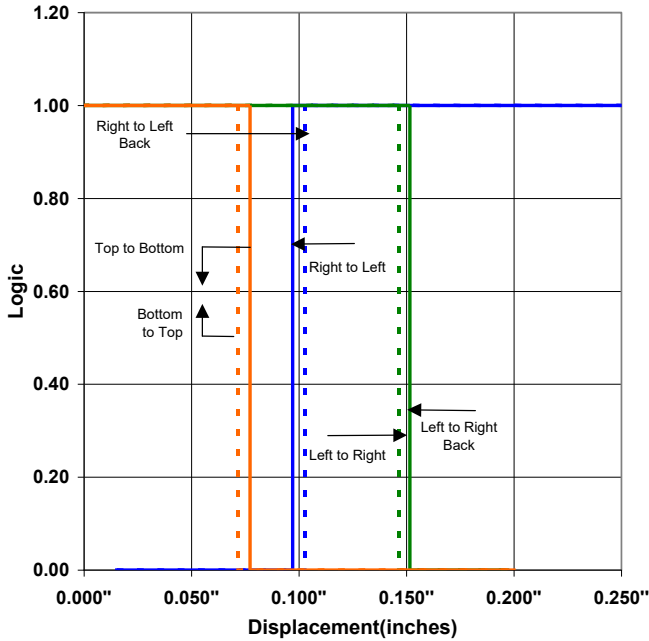
OPB615, OPB616, OPB618 Series

OPB625, OPB626, OPB627, OPB628 Series

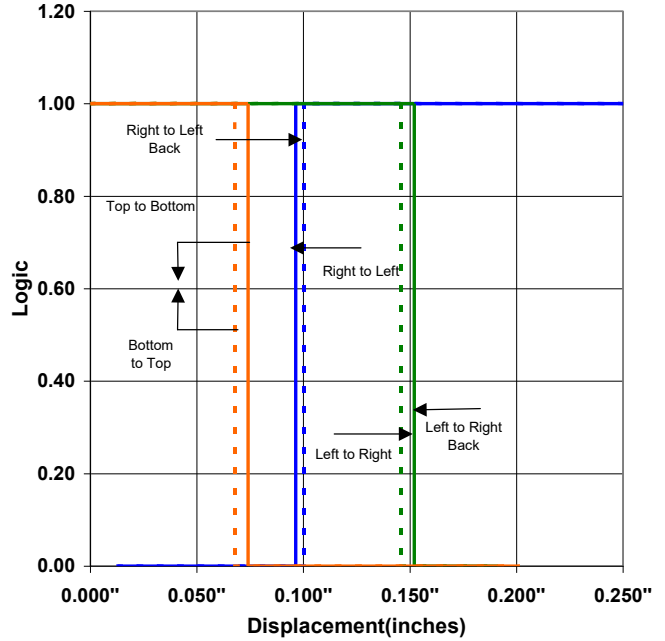
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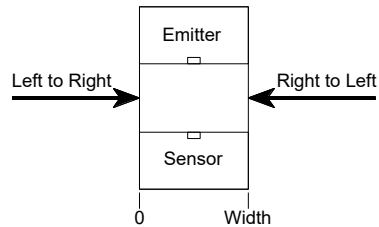
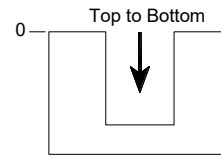
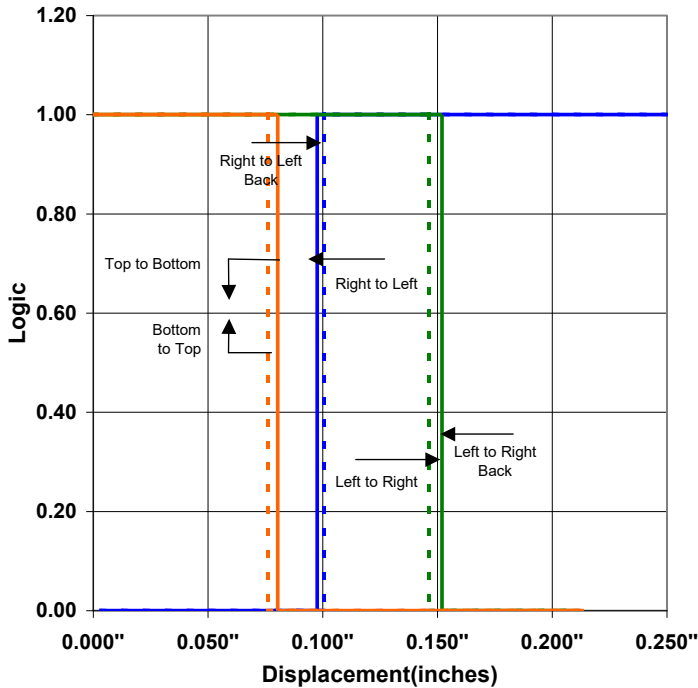
**OPB615 - Flag next to Emitter**



**OPB615 - Flag next to Sensor**



**OPB615 - Flag in Middle of Slot**



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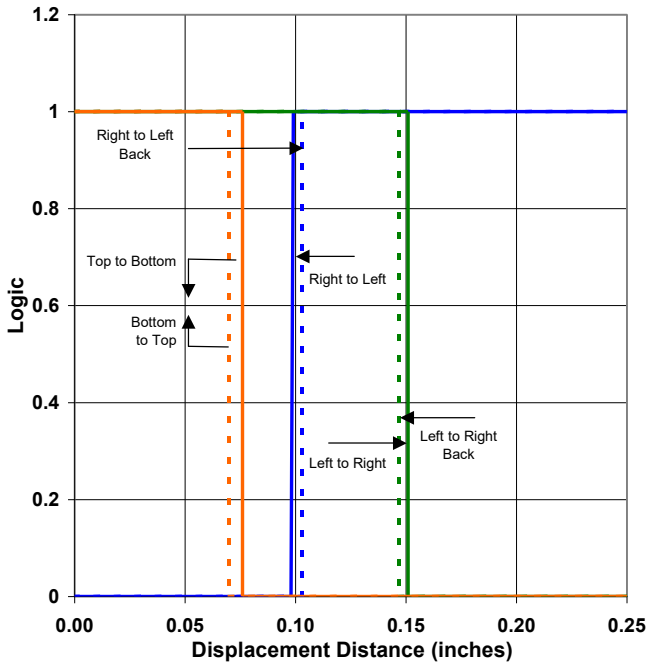
OPB615, OPB616, OPB618 Series

OPB625, OPB626, OPB627, OPB628 Series

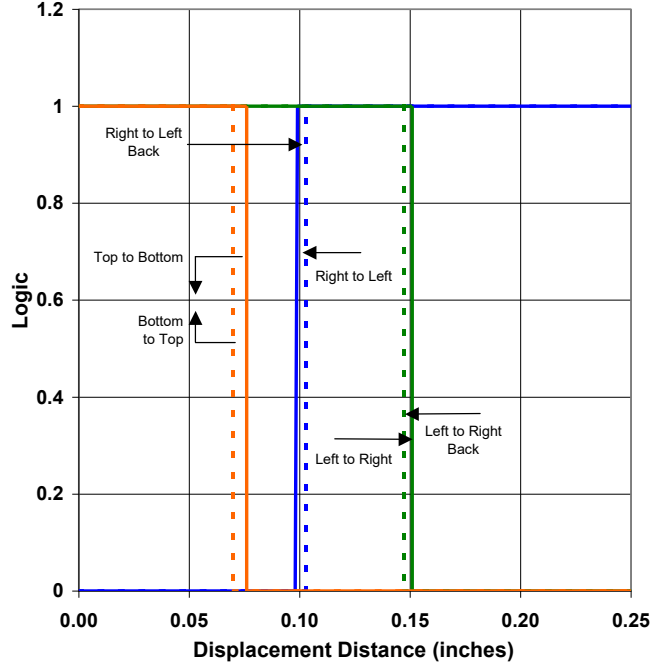
OPB665N, OPB666N, OPB667N Series



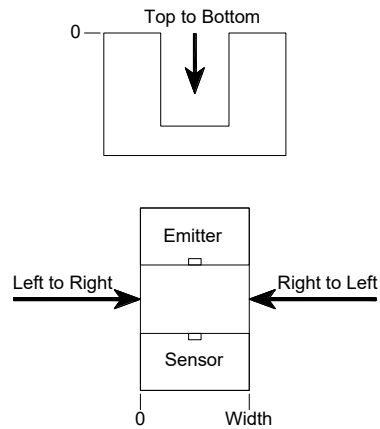
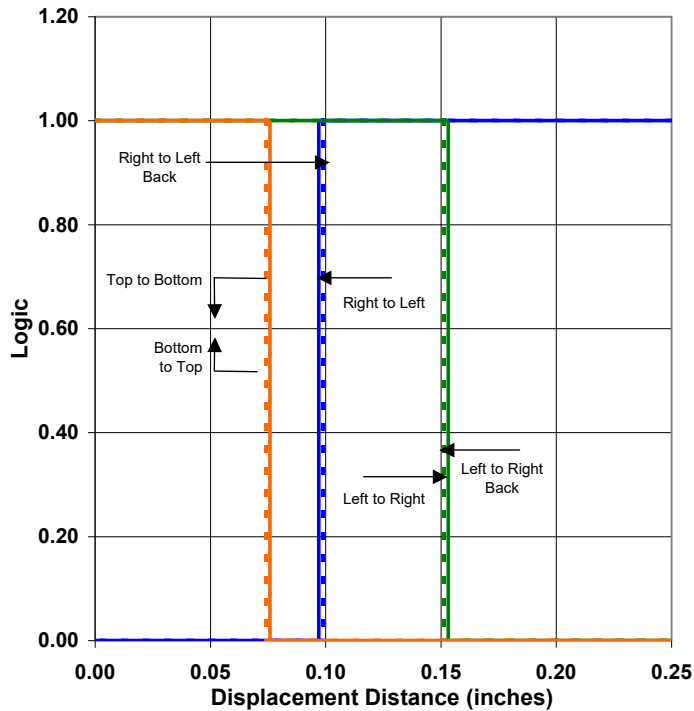
**OPB625 - Flag Next to Emitter**



**OPB625 - Flag Next to Sensor**



**OPB625 - Flag in Middle of Slot**



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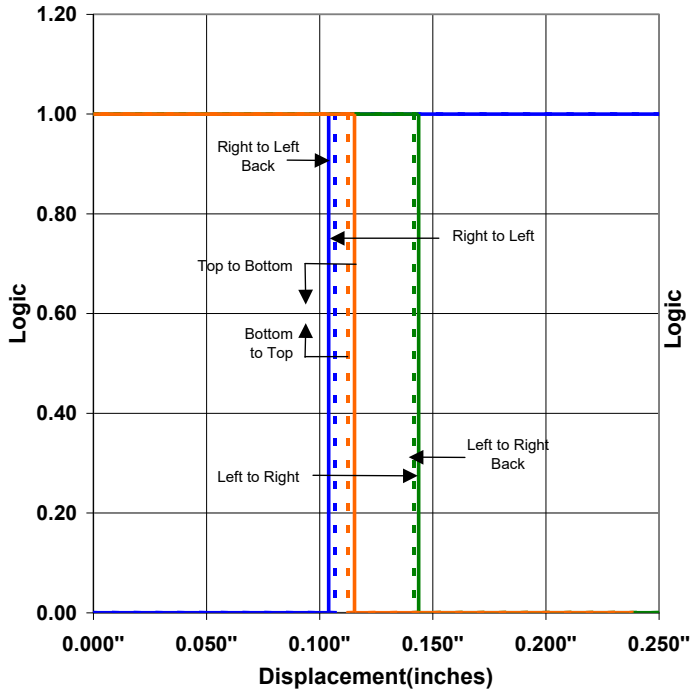
OPB615, OPB616, OPB618 Series

OPB625, OPB626, OPB627, OPB628 Series

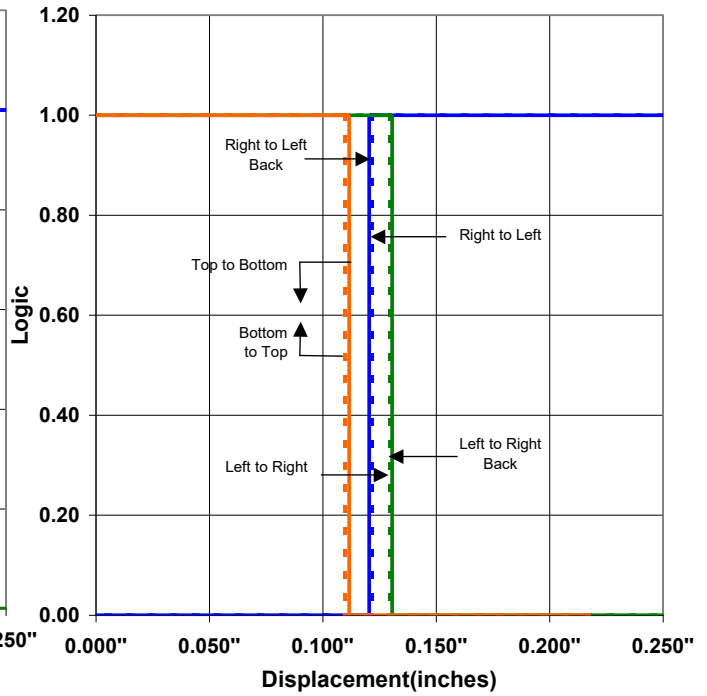
OPB665N, OPB666N, OPB667N Series



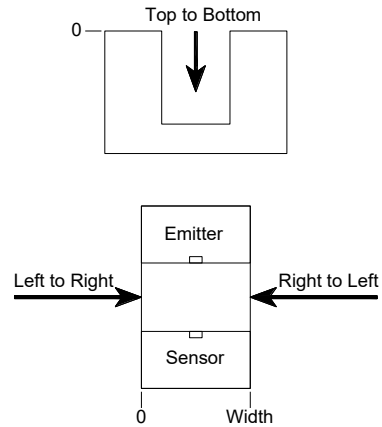
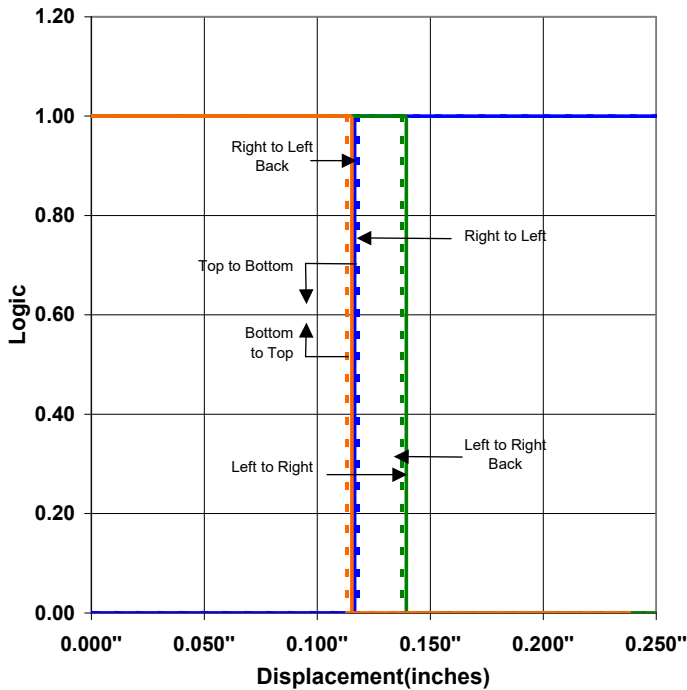
**OPB665 - Flag next to Emitter**



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-  Shortage Management
-  Alternative Solution
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