

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. **OPB665** 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/LSTTL 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	10K Pull-up					
OPB666T	Open Collector					
OPB667T	Inv-10K Pull-up					
OPB668T	Inv-Open Collector					



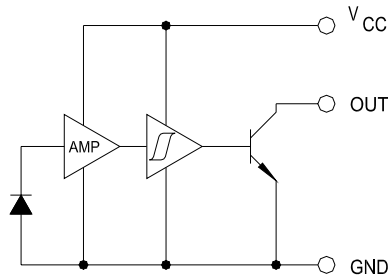
RoHS

OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.

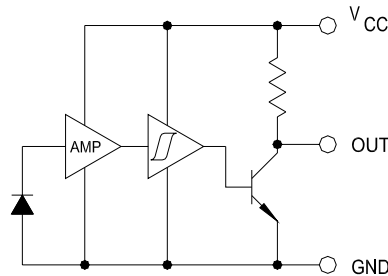
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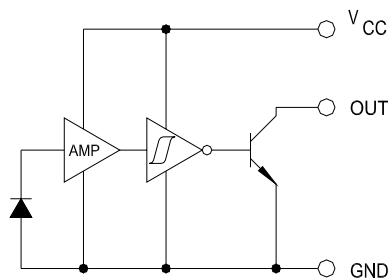
OPB 616/626/666N Buffered Open-Collector



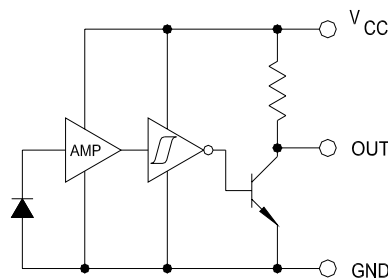
OPB615/625/665N Buffered 10K Pull-Up



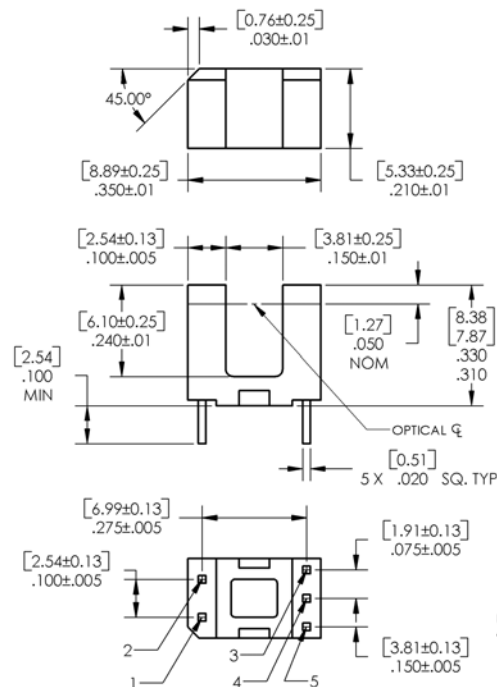
OPB618/628/668N Inverted Open-Collector



OPB617/627/667N Inverted 10K Pull-Up



OPB615, OPB616, OPB617, OPB618



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

DIMENSIONS ARE IN INCHES
AND [MILLIMETERS].

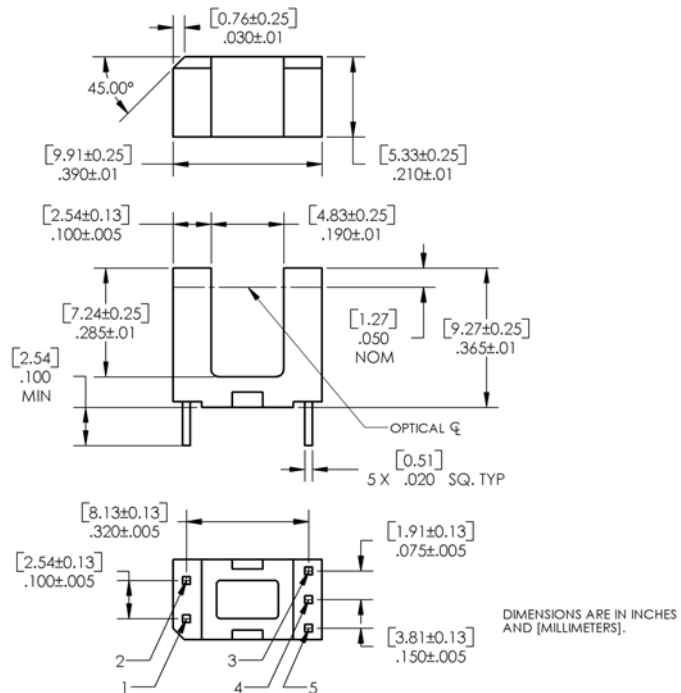
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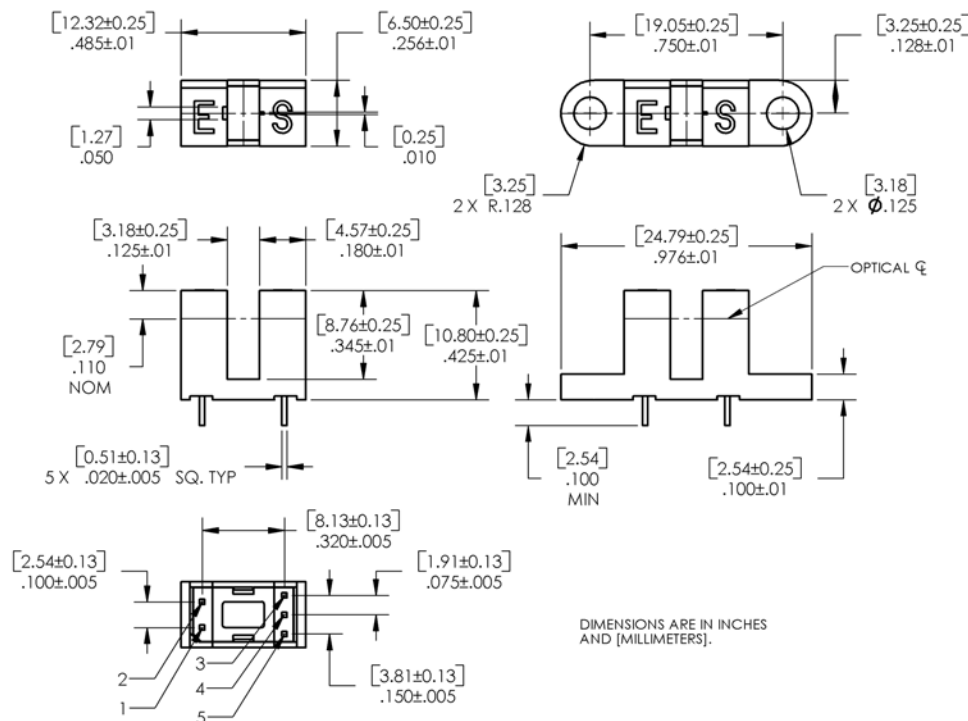


OPB625, OPB626, OPB627, OPB628

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



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 ($T_A=25^{\circ}\text{C}$ 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) ⁽¹⁾	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 ⁽²⁾	100 mW

Output Photologic®

Supply Voltage, V_{CC}	18 V
Duration of Output Short to V_{CC}	1 second
Voltage at Output ⁽⁵⁾	V_{CC}
Low Level Output Current (sinking)	16 mA
Power Dissipation ⁽³⁾	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 $I_F = 0$ mA.
- (5) Open Collector devices = 30 volts

Electrical Characteristics ($T_A = 25^{\circ}\text{C}$ unless otherwise noted)

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
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Input Diode

V_F	Forward Voltage	-	-	1.6	V	$I_F = 10$ mA
I_R	Reverse Current	-	-	100	μA	$V_R = 3$ V

Output Photologic® Sensor

V_{CC}	Operating DC Supply Voltage	4.5	-	16	V	
$I_{F(+)}$	LED Positive-Going Threshold Current	0.1	0.55	3	mA	$V_{CC} = 5$ V
		0.1	0.6	3		
		0.1	1.6	10		
$I_{F(+)} / I_{F(-)}$	Hysteresis	1.05	1.20	1.90		$V_{CC} = 5$ V

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Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

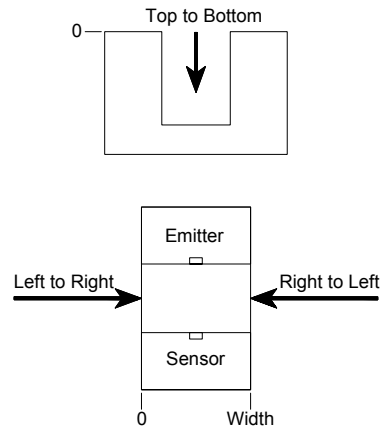
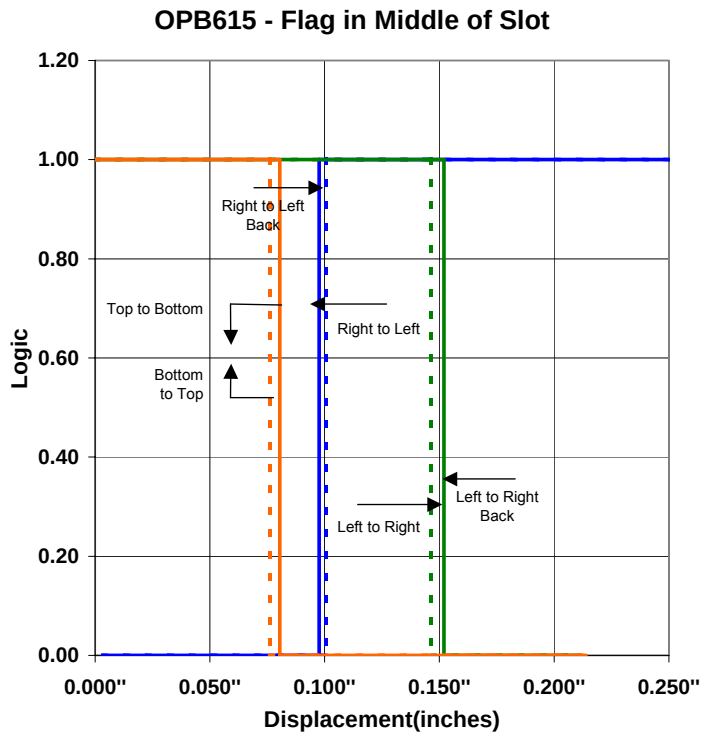
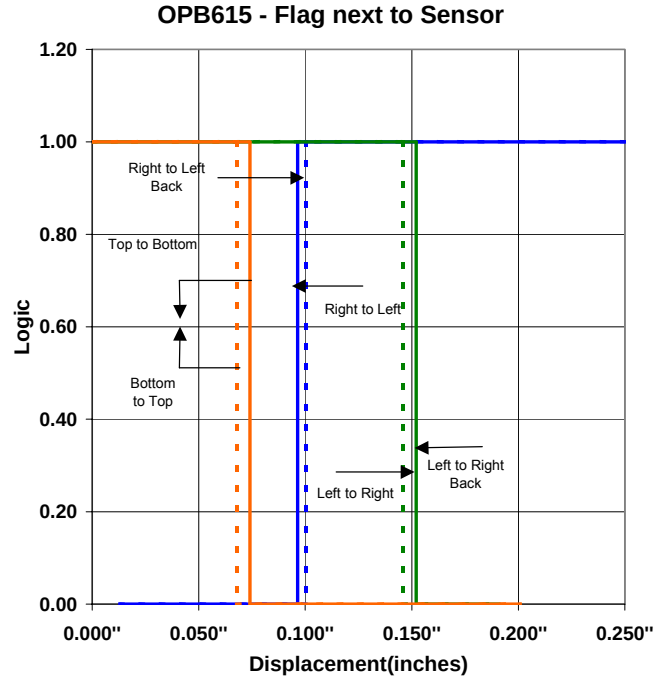
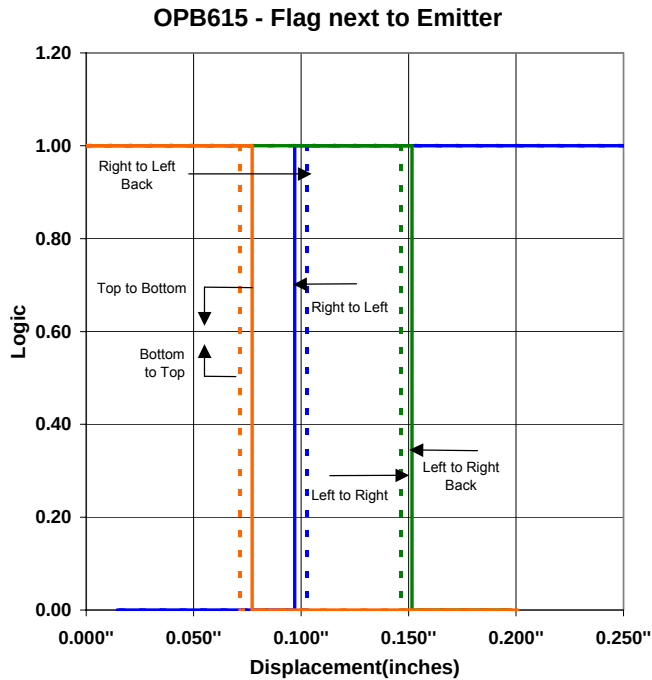
SYMBOL	PARAMETER		MIN	TYP	MAX	UNITS	TEST CONDITIONS
Output Photologic® Sensor							
I _{CCH}	High Level Supply Current: Buffer, 10k Pull-up Buffer, Open-Collector	OPB615, 625, 665 OPB616, 626, 666	- -	5 5	12 12	mA	NO LOAD on Output ⁽³⁾
	Inverted, 10k Pull-up Inverted, Open-Collector	OPB617, 627, 667 OPB618, 628, 668	- -	4 4	12 12	mA	NO LOAD on Output I _F = 0 mA
I _{CCL}	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 _F = 0 mA
	Inverted, 10k Pull-up Inverted, Open-Collector	OPB617, 627, 667 OPB618, 628, 668	- -	6.5 5.0	12 12	mA	NO LOAD on Output ⁽³⁾
V _{OH}	High Level Output Voltage: Buffer, 10k Pull-up Buffer, Open-Collector	OPB615, 625, 665 OPB616, 626, 666	V _{CC} -1.5 -	- -	- -	V	I _{OH} = 100 µA ⁽³⁾
	Inverter, 10k Pull-up Inverter, Open-Collector	OPB617, 627, 667 OPB618, 628, 668	V _{CC} -1.5 -	- -	- -	V	I _{OH} = 100 µA ⁽¹⁾ I _F = 0 mA
I _{OH}	High Level Output Voltage: Buffer, Open-Collector	OPB616, 626, 666	-	-	100	µA	V _{OH} = 30 V ⁽³⁾
	Inverter, Open-Collector	OPB618, 628, 668	-	-	100	µA	I _F = 0 mA, V _{OH} = 30 V ⁽¹⁾
V _{OL}	Low Level Output Voltage: Buffer, 10k Pull-up Buffer, Open-Collector	OPB615, 625, 665 OPB616, 626, 666	-	-	0.4	V	I _{OL} = 16 mA, V _{CC} = 4.5 V ⁽³⁾⁽¹⁾
	Inverter, 10k Pull-up Inverter, Open-Collector	OPB617, 627, 667 OPB618, 628, 668	-	-	0.4	V	I _{OL} = 16 mA, I _F = 0 mA
t _r , t _f	Output Rise Time, Output Fall Time			30		ns	f = 10 kHz, R _L = 300 Ω, DC = 50% ⁽³⁾
t _{PLH}	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	OPB617, 627, 667 OPB618, 628, 668		3.0		µs	
t _{PHL}	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	OPB617, 627, 667 OPB618, 628, 668		0.6		µs	
Data Rate			-	100	-	kHz	R _L = 300 Ω, DC = 50% ⁽⁴⁾

Notes:

- (1) Normal application would be with light source blocked, simulated by $I_F = 0$ mA.
- (2) $V_{OH} = V_{CC}-1.5\text{V}$ for $V_{CC} = 4.5$ to 16 Volts.
- (3) $I_F = 5$ mA OPB615 to OPB628; $I_F = 10$ mA OPB665 to OPB668
- (4) $I_F = 0$ to 5 mA OPB615 to OPB628; $I_F = 0$ to 10 mA OPB665 to OPB668

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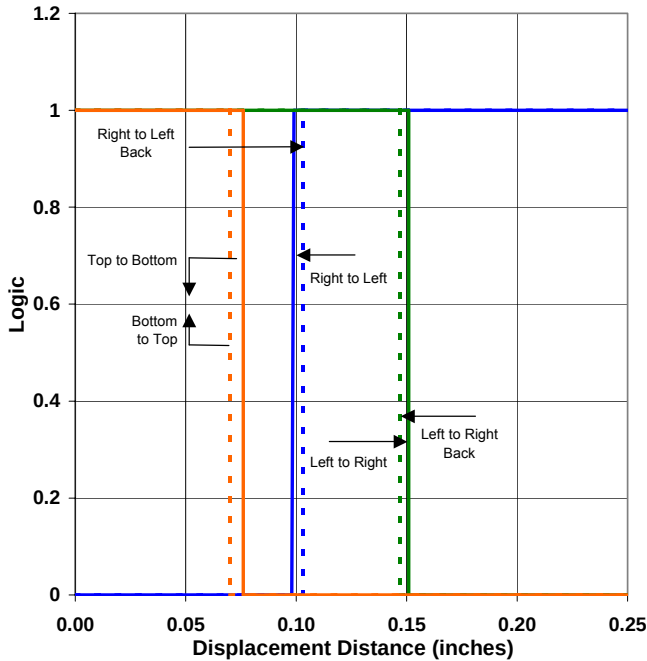


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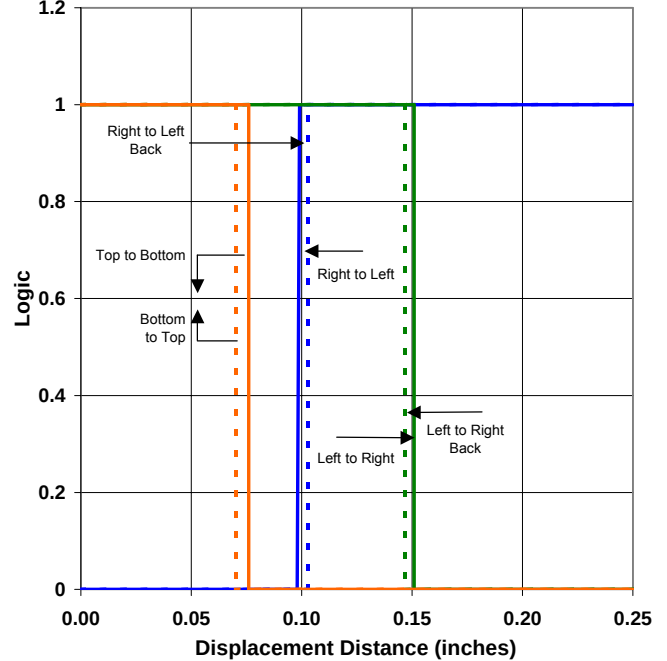
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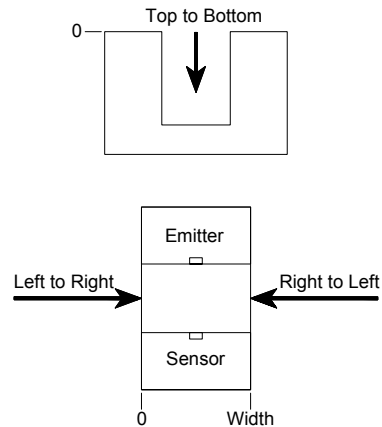
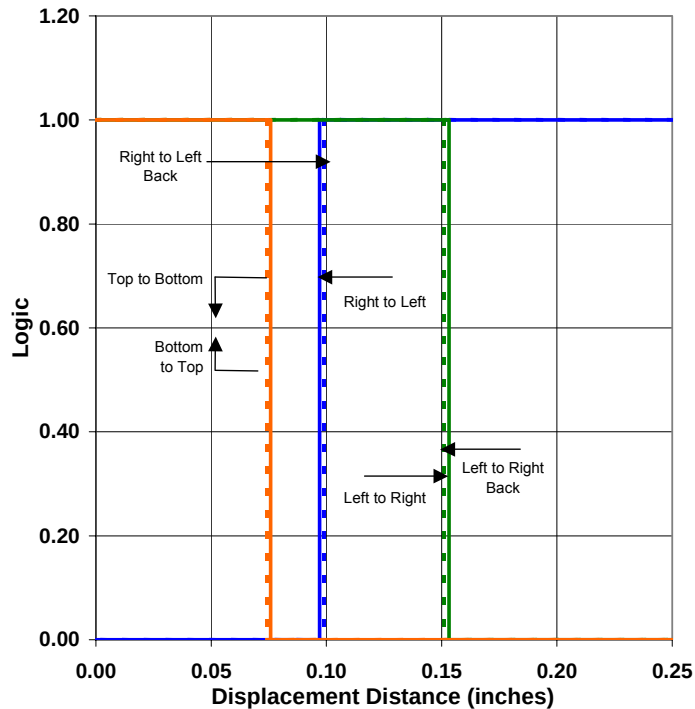
OPB625 - Flag Next to Emitter



OPB625 - Flag Next to Sensor



OPB625 - Flag in Middle of Slot

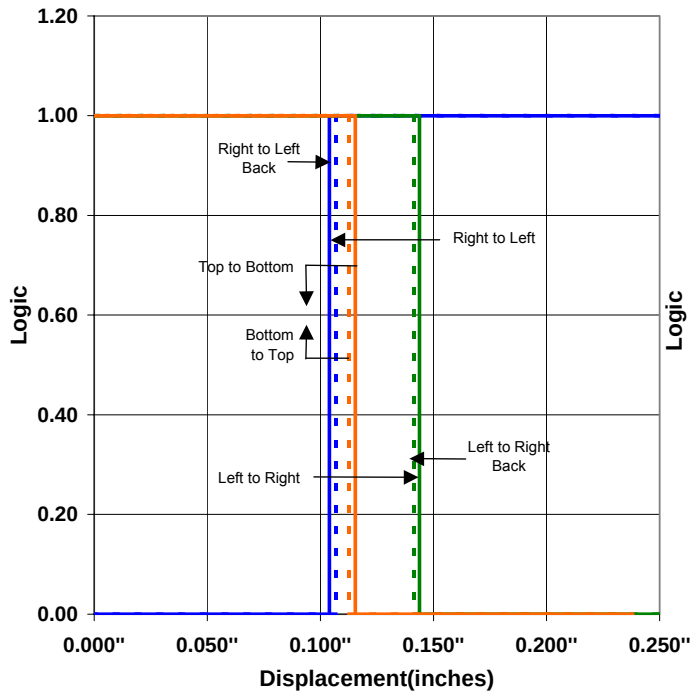


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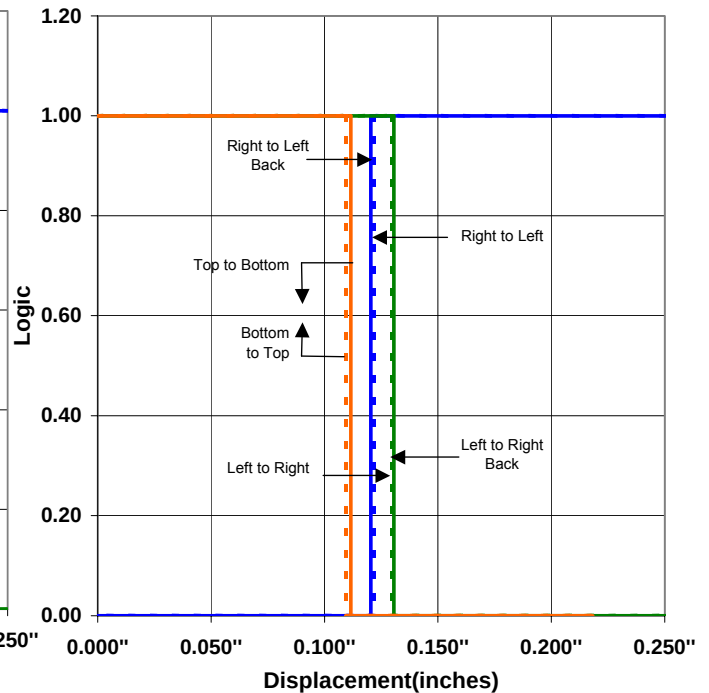
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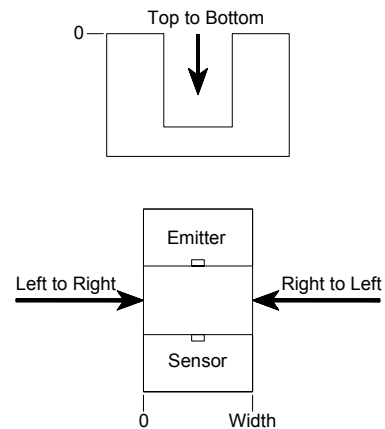
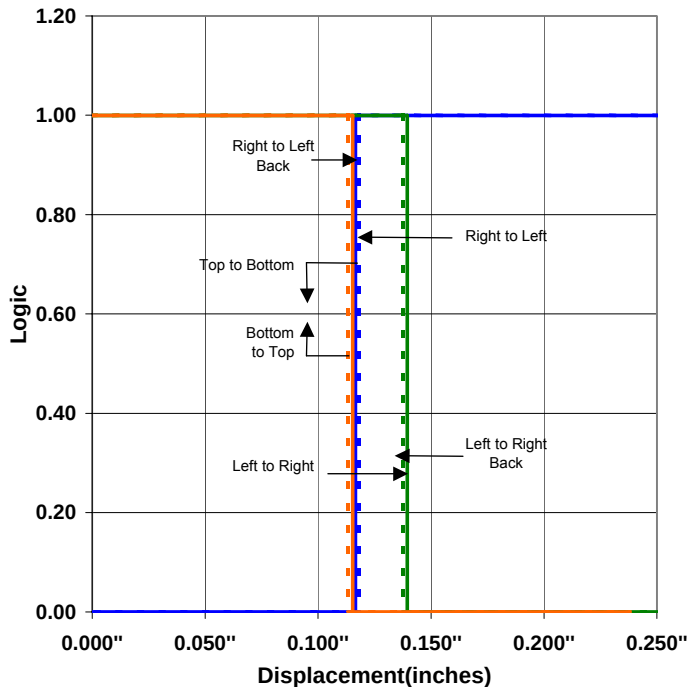
OPB665 - Flag next to Emitter



OPB665 - Flag next to Sensor



OPB665 - Flag in Middle of Slot



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