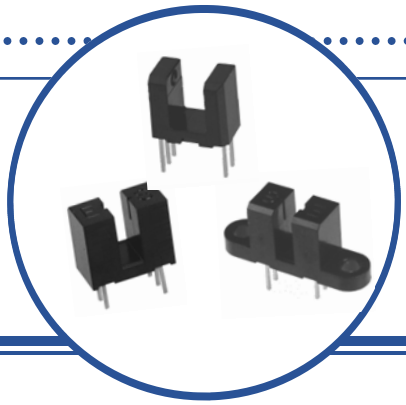
Photologic® Slotted Optical Switch

OPB615, OPB616, OPB617, OPB618 Series

OPB625, OPB626, OPB627, OPB628 Series

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

TT electronics
OPTEK Technology



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

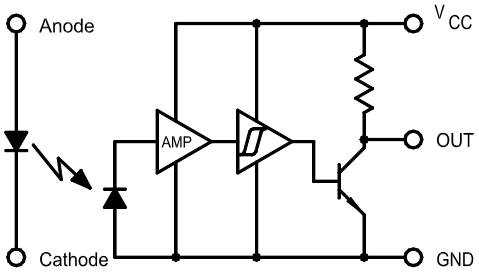
Ordering Information

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	T	10K Pull-up			
OPB666T		Open Collector			
OPB667T		Inv-10K Pull-up			
OPB668T		Inv-Open Collector			

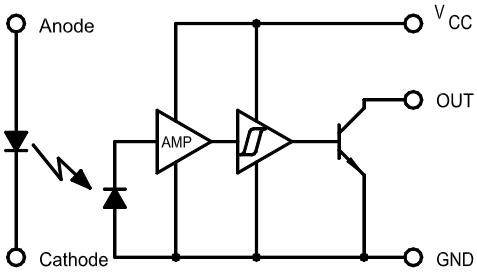
RoHS

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

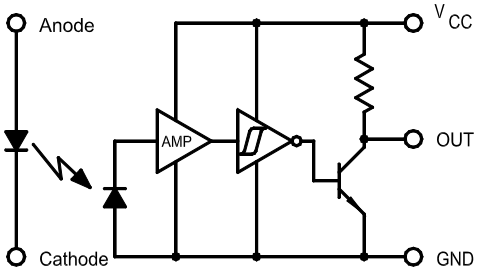
OPB615/625/665N Buffered 10K Pull-Up



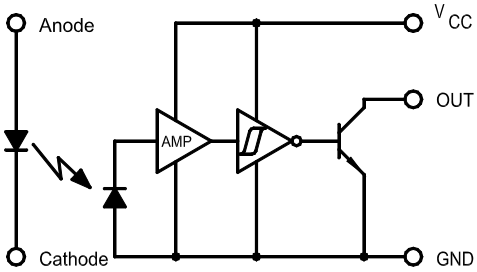
OPB 616/626/666N Buffered Open-Collector



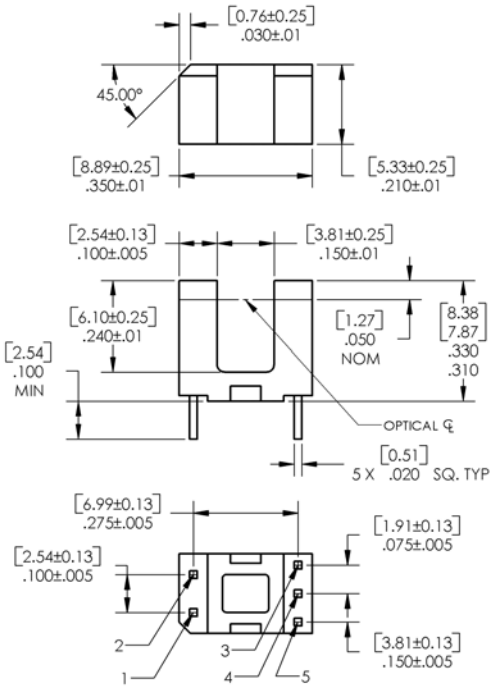
OPB617/627/667N Inverted 10K Pull-Up



OPB618/628/668N Inverted Open-Collector



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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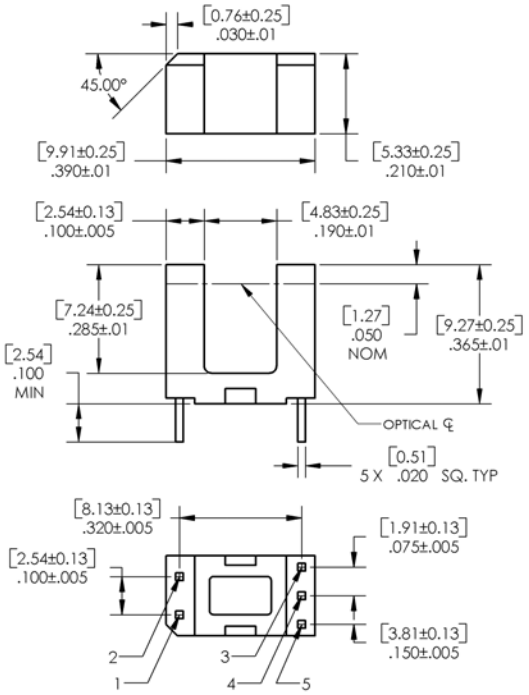
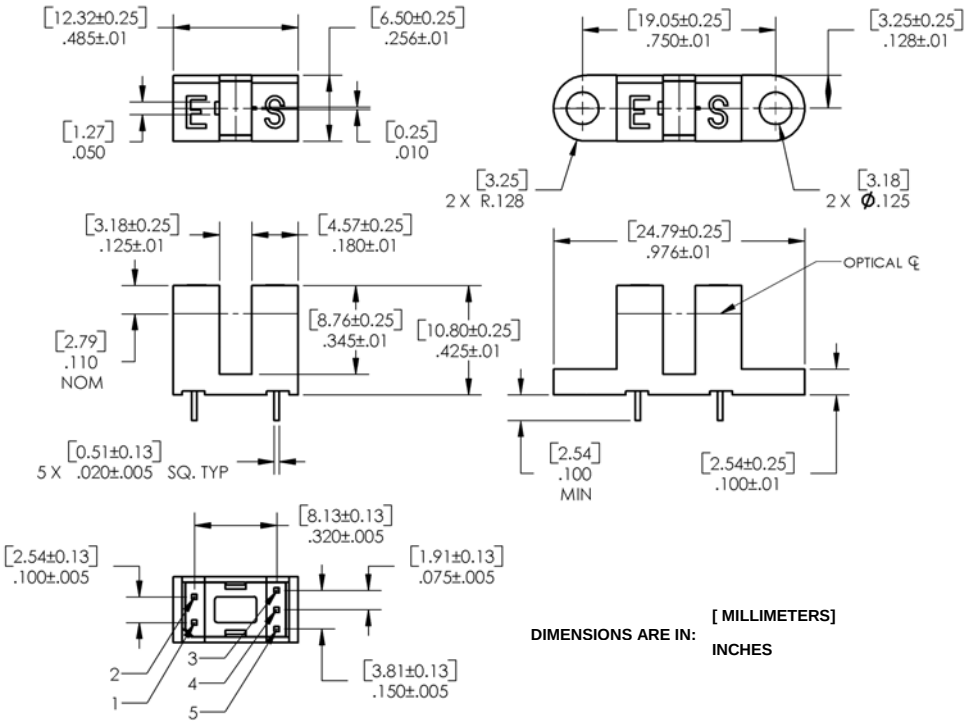
OPB625, OPB626, OPB627, OPB628

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

DIMENSIONS ARE IN: **[MILLIMETERS]**
INCHES

Absolute Maximum Ratings (T_A=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)(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)	Vcc
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°C unless otherwise noted)

SYMBOL	PARAMETER		MIN	TYP	MAX	UNITS	TEST CONDITIONS
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	OPB615-618 OPB625-628 OPB665-668	0.1 0.1 0.1	0.55 0.6 1.6	3 3 10	mA	V_{CC} = 5 V
$I_{F(+)}/I_{F(-)}$	Hysteresis		1.05	1.20	1.90		V_{CC} = 5 V

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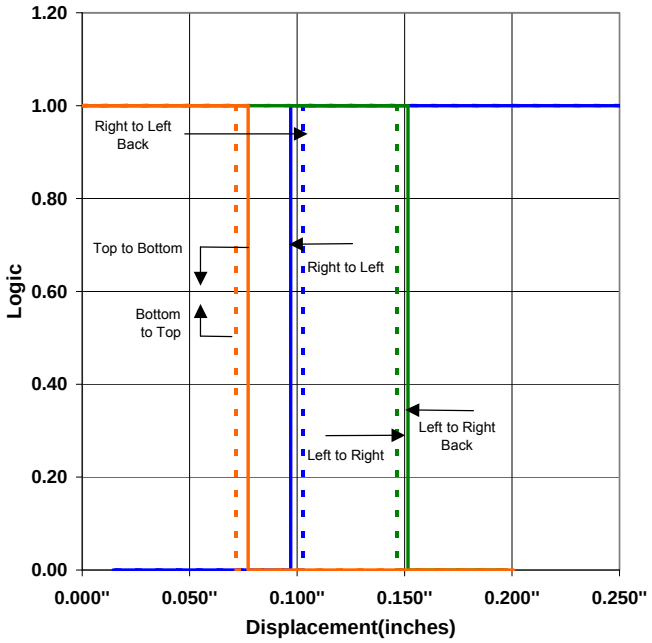
Electrical Characteristics (T_A = 25°C unless otherwise noted)

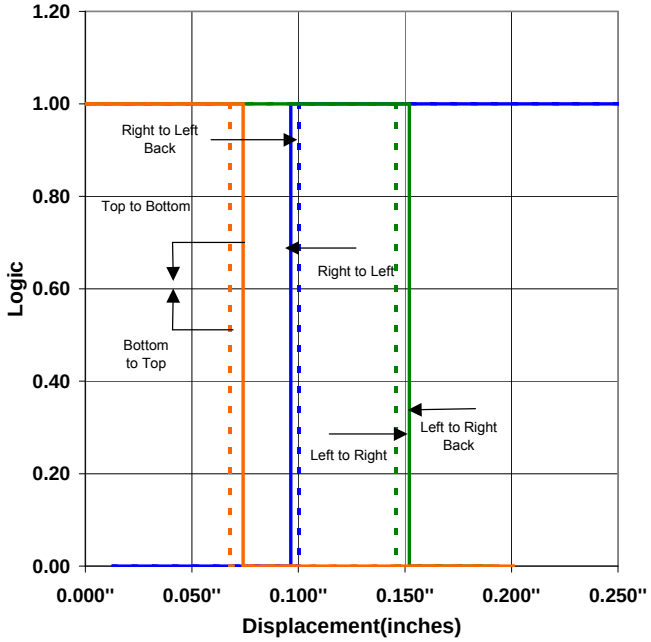
SYMBOL	PARAMETER		MIN	TYP	MAX	UNITS	TEST CONDITIONS
Output Photologic® Sensor							
I_{CCH}	High Level Supply Current: Buffer, 10k Pull-up Buffer, Open-Collector	 OPB615, 625, 665 OPB616, 626, 666	 - -	 5 5	 12 12	mA	NO LOAD on Output(3)
	Inverted, 10k Pull-up Inverted, Open-Collector	OPB617, 627, 667 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, Vcc = 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}-1.5V 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

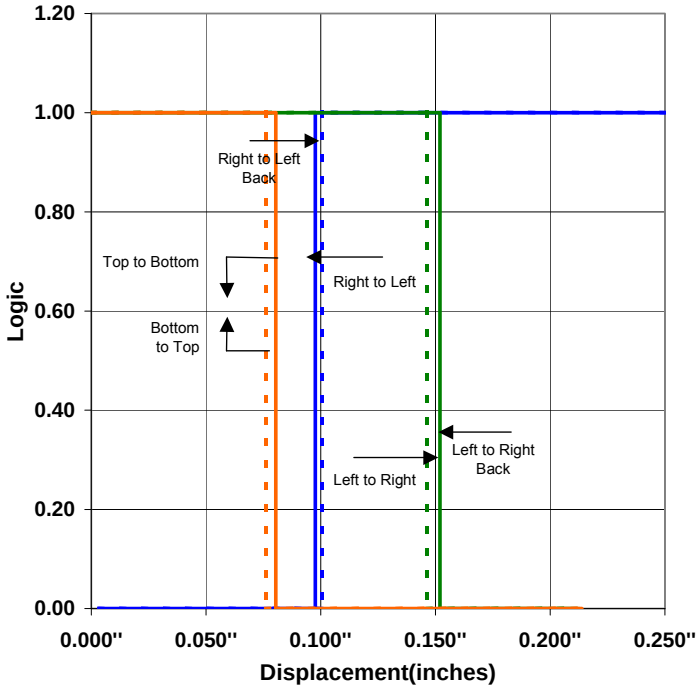
OPB615 - Flag next to Emitter

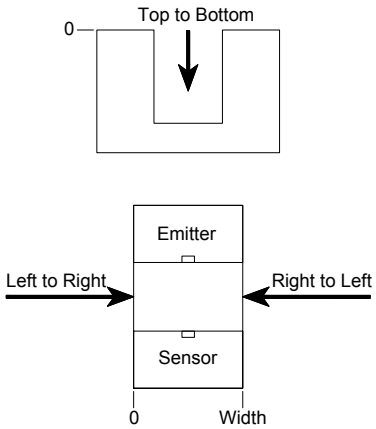


OPB615 - Flag next to Sensor



OPB615 - Flag in Middle of Slot





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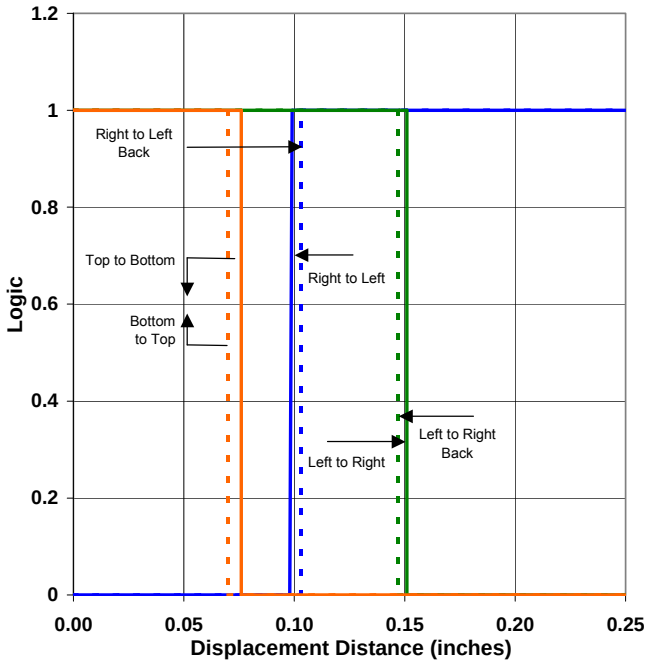
OPB625 - Flag Next to Emitter



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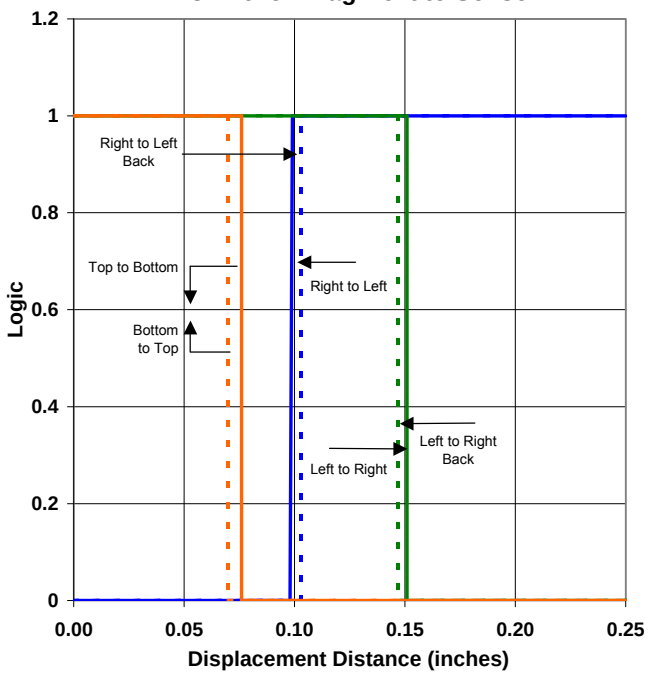

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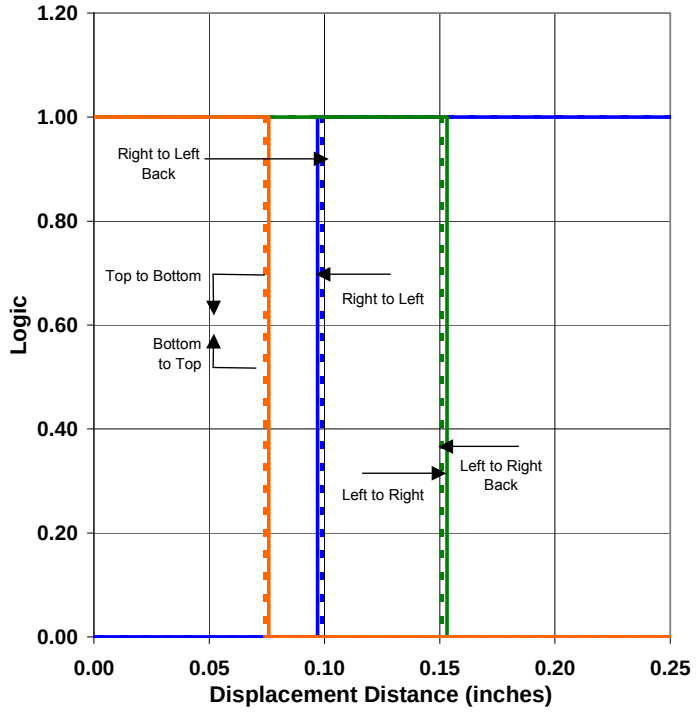

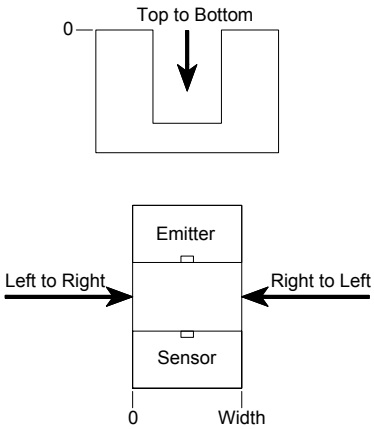

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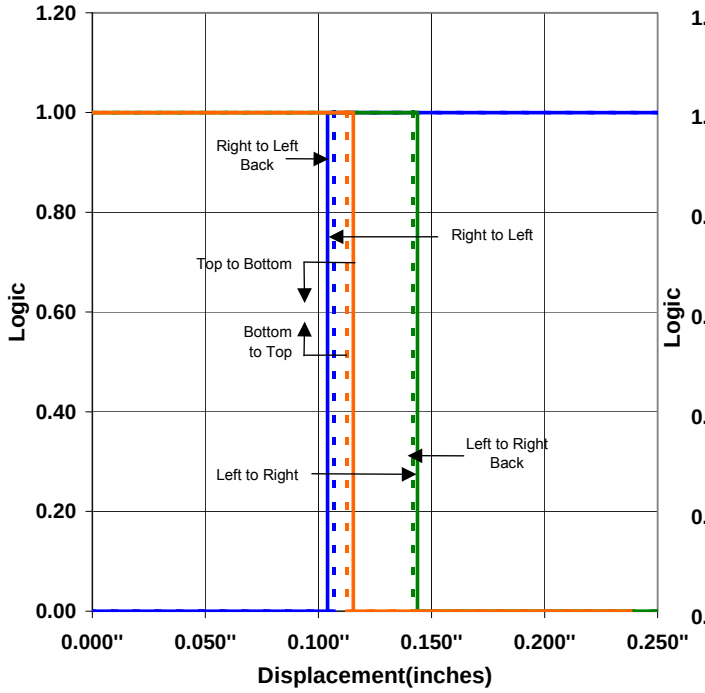

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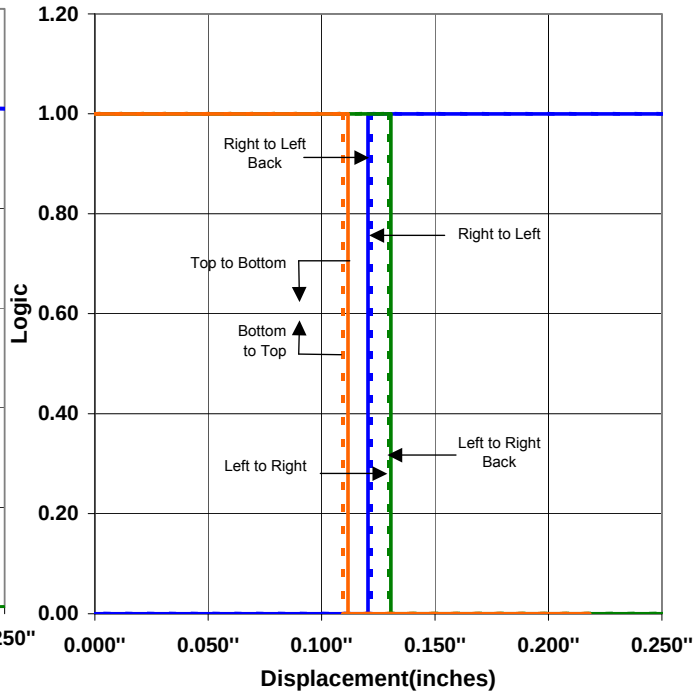

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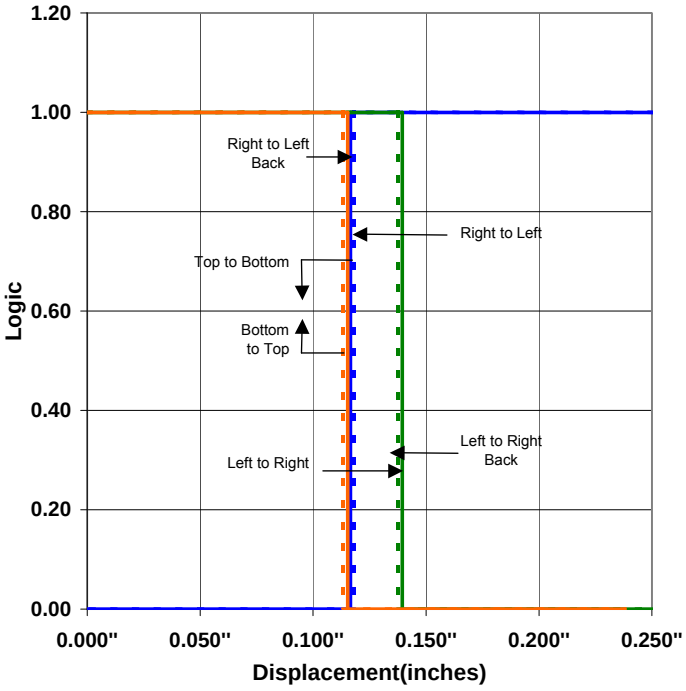

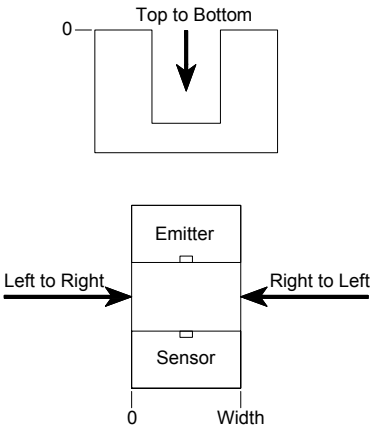

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