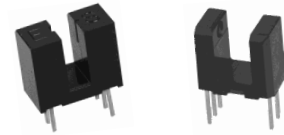


Photologic® Slotted Optical Switch

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 | | | | | |



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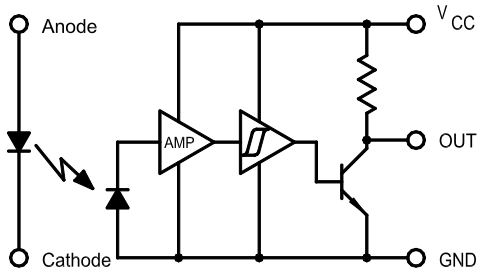
OPB615, OPB616, OPB618 Series

OPB625, OPB626, OPB627, OPB628 Series

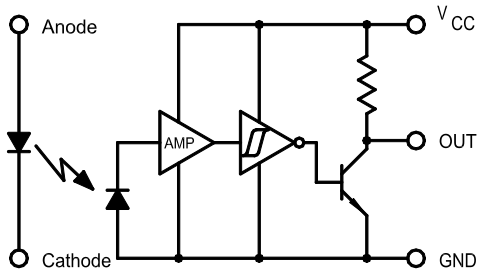
OPB665N, OPB666N, OPB667N Series



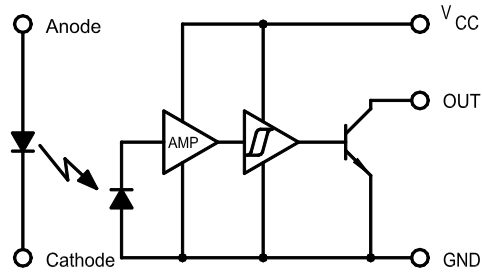
OPB615/625/665N Buffered 10 K Pull-Up



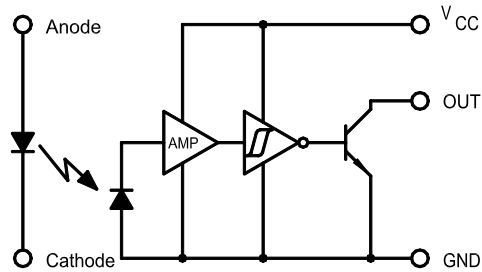
Photologic with Pull-Up-Resistor Inverted Output



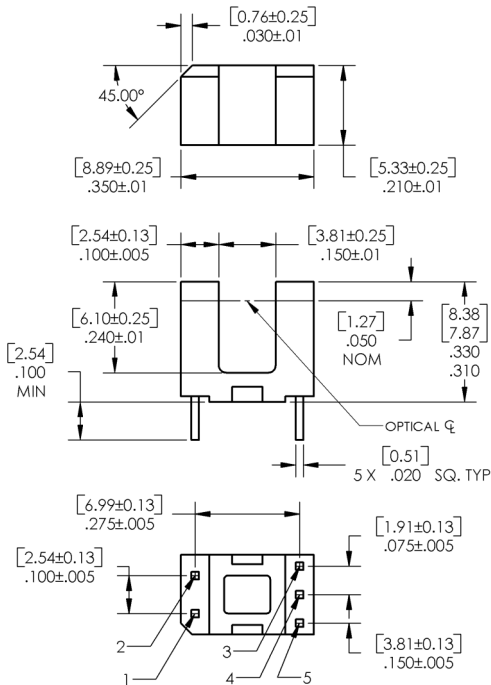
OPB616/626/666N Buffered Open-Collector



Photologic with Open Collector Inverted Output



OPB615, OPB616, OPB618



| Pin Color/ Number | Description |
|----------------------|-----------------|
| 1 | Anode |
| 2 | Cathode |
| 3 | V _{CC} |
| 4 | Output |
| 5 | Ground |

DIMENSIONS ARE IN: [MILLIMETERS]
INCHES

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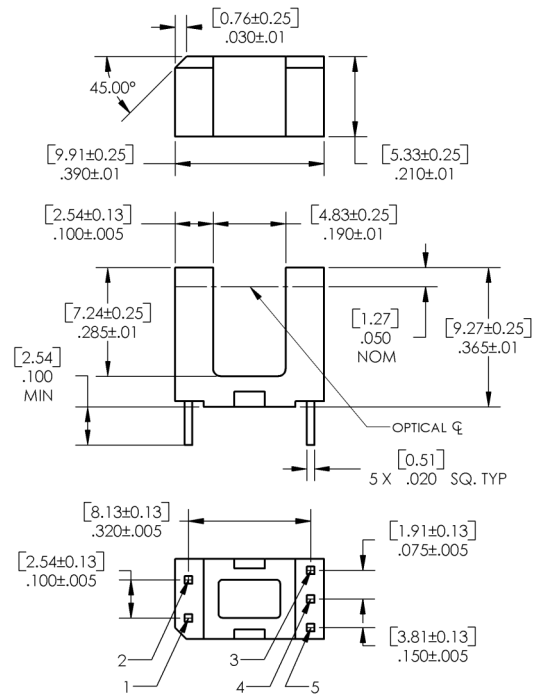
OPB625, OPB626, OPB627, OPB628 Series

OPB665N, OPB666N, OPB667N Series



OPB625, OPB626, OPB627, OPB628

| Pin Color/ Number | Description |
|----------------------|-----------------|
| 1 | Anode |
| 2 | Cathode |
| 3 | V _{CC} |
| 4 | Output |
| 5 | Ground |



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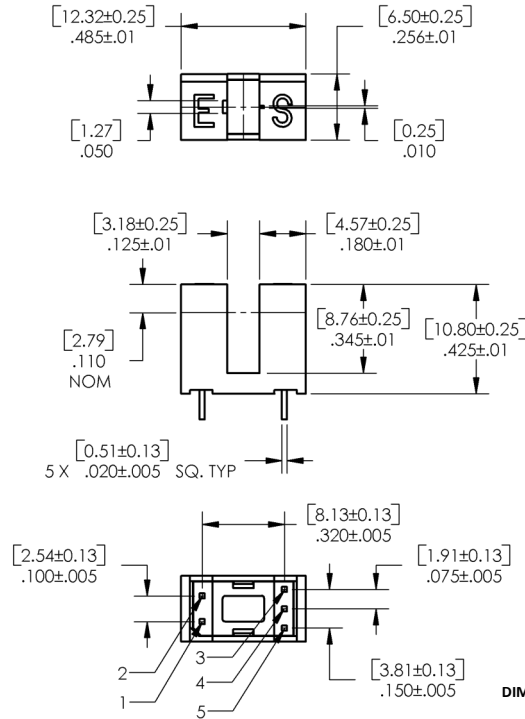
OPB615, OPB616, OPB618 Series

OPB625, OPB626, OPB627, OPB628 Series

OPB665N, OPB666N, OPB667N Series



OPB665N, OPB666N, OPB667N



| Pin Color/ Number | Description |
|----------------------|-----------------|
| 1 | Anode |
| 2 | Cathode |
| 3 | V _{CC} |
| 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 (1.6 mm) 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 |
|--------|-----------|-----|-----|-----|-------|-----------------|
|--------|-----------|-----|-----|-----|-------|-----------------|

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 | 0.1 | 0.55 | 3 | mA $V_{CC} = 5$ V |
| | | OPB625-628 | 0.1 | 0.6 | 3 | |
| | | OPB665-667 | 0.1 | 1.6 | 10 | |
| $I_{F(+)} / I_{F(-)}$ | Hysteresis | 1.05 | 1.20 | 1.90 | - | $V_{CC} = 5$ V |

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OPB625, OPB626, OPB627, OPB628 Series

OPB665N, OPB666N, OPB667N Series



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 | OPB615, 625, 665 | - | 5 | 12 | mA | NO LOAD on Output ⁽³⁾ |
| | Buffer, Open-Collector | OPB616, 626, 666 | - | 5 | 12 | | |
| | Inverted, 10k Pull-up | OPB627, 667 | - | 4 | 12 | mA | NO LOAD on Output I _F = 0 mA |
| | Inverted, Open-Collector | OPB618, 628 | - | 4 | 12 | | |
| I _{CCL} | Low Level Supply Current: Buffer, 10k Pull-up | OPB615, 625, 665 | - | 5.5 | 12 | mA | NO LOAD on Output I _F = 0 mA |
| | Buffer, Open-Collector | OPB616, 626, 666 | - | 4.0 | 12 | | |
| | Inverted, 10k Pull-up | OPB627, 667 | - | 6.5 | 12 | mA | NO LOAD on Output ⁽³⁾ |
| | Inverted, Open-Collector | OPB618, 628 | - | 5.0 | 12 | | |
| V _{OH} | High Level Output Voltage: Buffer, 10k Pull-up | OPB615, 625, 665 | V _{CC} - 1.5 | - | - | V | I _{OH} = 100 μA ⁽³⁾ |
| | Buffer, Open-Collector | OPB616, 626, 666 | - | - | - | | |
| | Inverter, 10k Pull-up | OPB627, 667 | V _{CC} - 1.5 | - | - | V | I _{OH} = 100 μA ⁽¹⁾ I _F = 0 mA |
| | Inverter, Open-Collector | OPB618, 628 | - | - | - | | |
| I _{OH} | High Level Output Voltage: Buffer, Open-Collector | OPB616, 626, 666 | - | - | 100 | μA | V _{OH} = 30 V ⁽³⁾ |
| | Inverter, Open-Collector | OPB618, 628 | - | - | 100 | | |
| V _{OL} | Low Level Output Voltage: Buffer, 10k Pull-up | OPB615, 625, 665 | - | - | 0.4 | V | I _{OL} = 16 mA, V _{CC} = 4.5 V ⁽³⁾⁽¹⁾ |
| | Buffer, Open-Collector | OPB616, 626, 666 | - | - | 0.4 | | |
| | Inverter, 10k Pull-up | OPB627, 667 | - | - | 0.4 | V | I _{OL} = 16 mA, I _F = 0 mA |
| | Inverter, Open-Collector | OPB618, 628 | - | - | 0.4 | | |
| 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 | | - | 0.6 | - | μs | |
| | Buffer, Open-collector | | OPB615, 625, 665 | OPB616, 626, 666 | - | - | |
| | Inverter, 10k Pull-up | | - | 3.0 | - | μs | |
| | Inverter, Open-Collector | | OPB627, 667 | OPB618, 628 | - | - | |
| t _{PHL} | Propagation Delay, High-Low Buffer, 10k Pull-up | | - | 3.0 | - | μs | |
| | Buffer, Open-collector | | OPB615, 625, 665 | OPB616, 626, 666 | - | - | μs |
| | Inverter, 10k Pull-up | | - | 0.6 | - | μs | |
| | Inverter, Open-Collector | | OPB627, 667 | OPB618, 628 | - | - | μs |
| Data Rate | | | - | 100 | - | kHz | R _L = 300 Ω, DC = 50% ⁽⁴⁾ |

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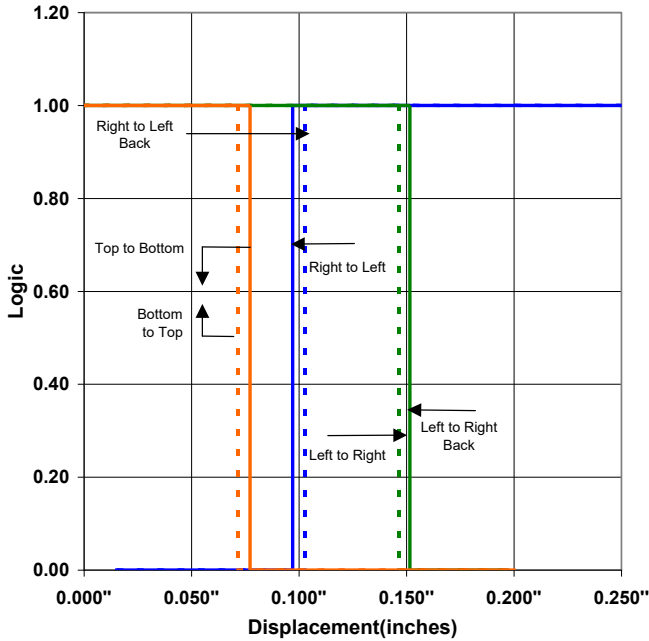
OPB615, OPB616, OPB618 Series

OPB625, OPB626, OPB627, OPB628 Series

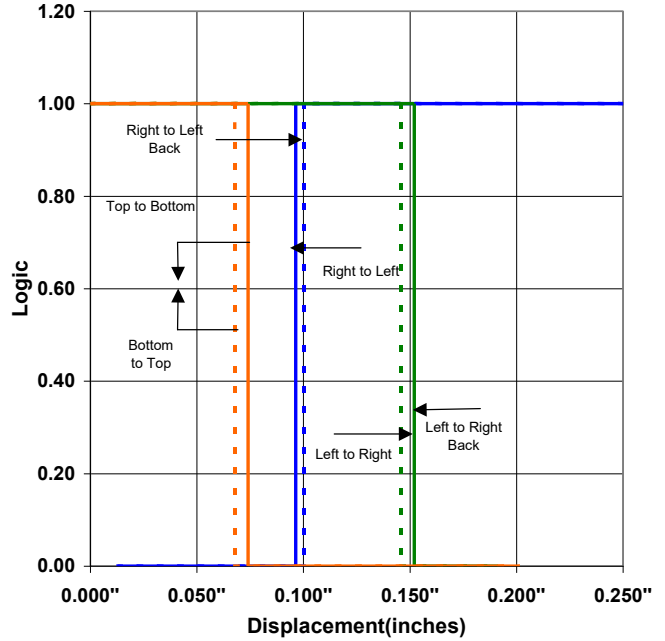
OPB665N, OPB666N, OPB667N Series



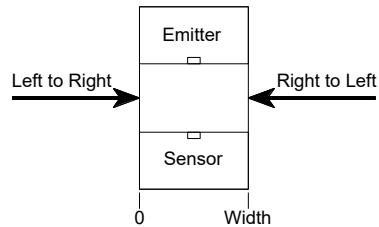
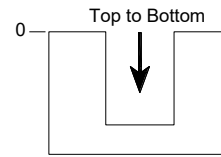
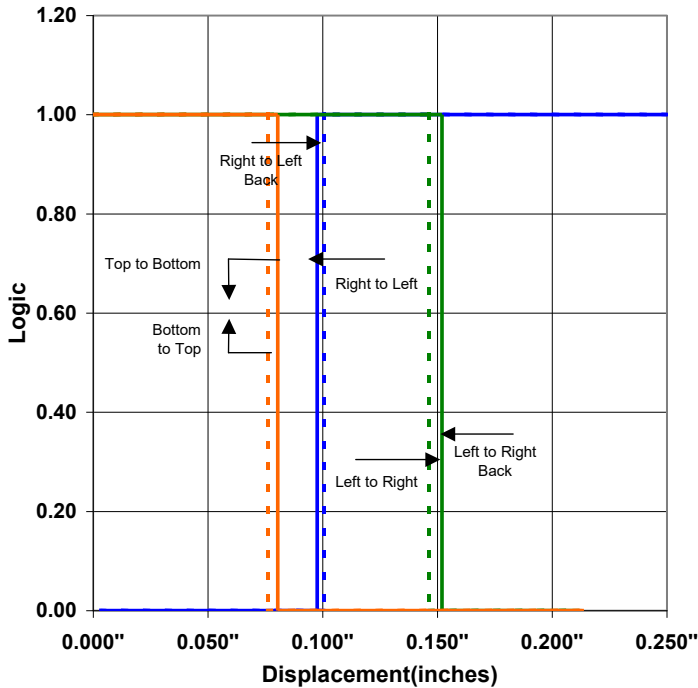
OPB615 - Flag next to Emitter



OPB615 - Flag next to Sensor



OPB615 - Flag in Middle of Slot



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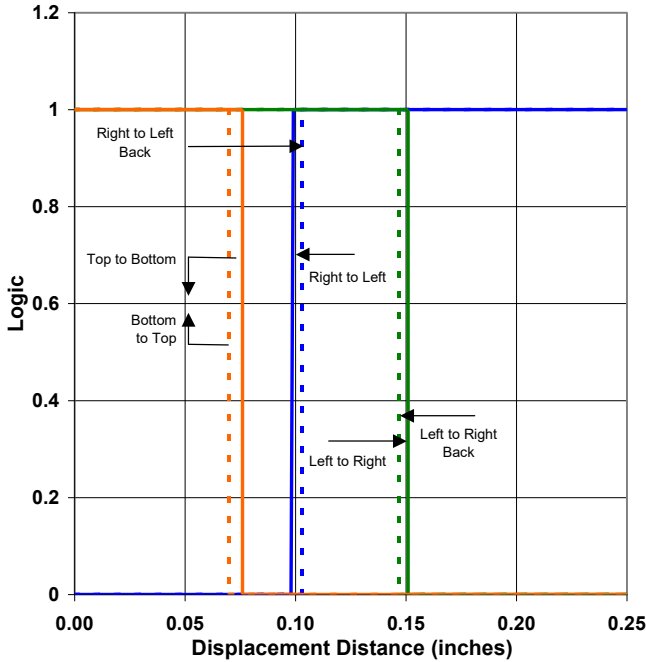
OPB615, OPB616, OPB618 Series

OPB625, OPB626, OPB627, OPB628 Series

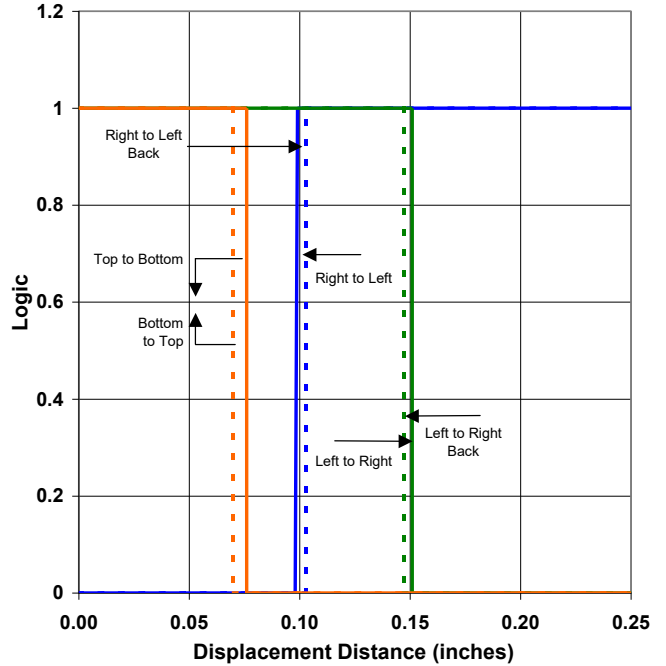
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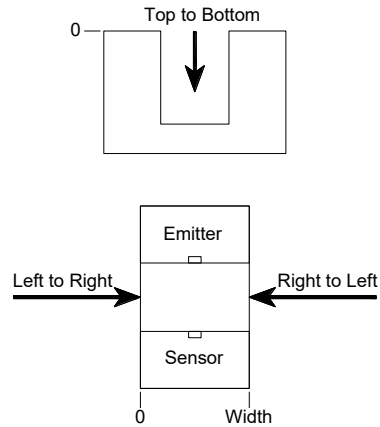
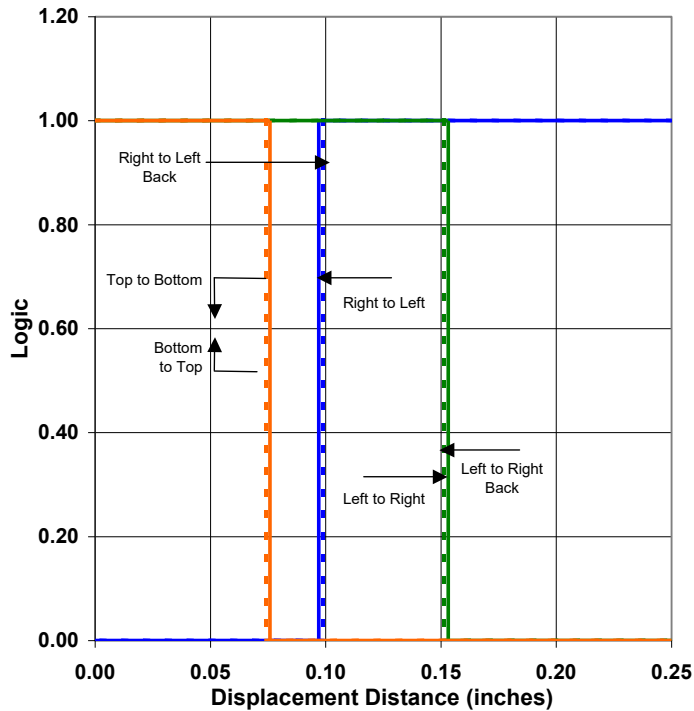
OPB625 - Flag Next to Emitter



OPB625 - Flag Next to Sensor



OPB625 - Flag in Middle of Slot



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