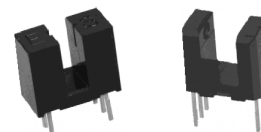


Photologic® Slotted Optical Switch

OPB615, OPB616, OPB618 Series

OPB625, OPB626, OPB627, OPB628 Series

OPB665N, OPB666N, OPB667N Series



Features:

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

Description:

Each slotted optical switch consists of an 890 nm, infrared Light Emitting Diode (LED) and a monolithic integrated circuit that incorporates a voltage regulator, 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 K Ω 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			
OPB618		Inv-Open Collector			
OPB625		10k Pull-up		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			



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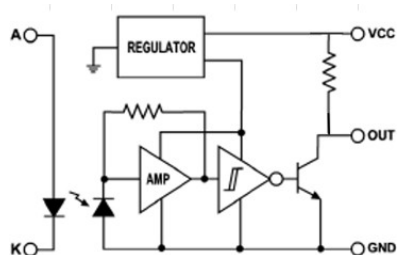
OPB615, OPB616, OPB618 Series

OPB625, OPB626, OPB627, OPB628 Series

OPB665N, OPB666N, OPB667N Series

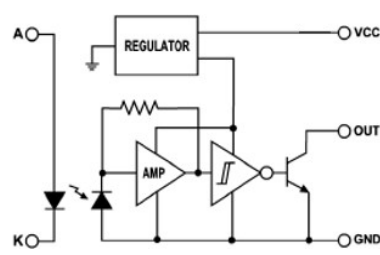


OPB615/625/665N Buffered 10K Pull-Up

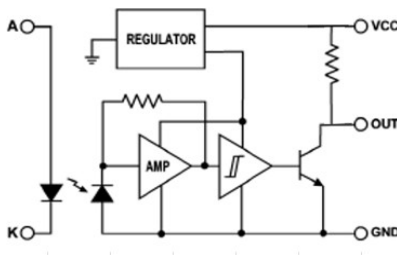


With Light
Output — High

OPB616/626/666N Buffered Open-Collector

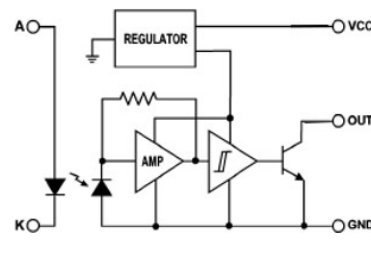


OPB618/627/667N Inverted 10K Pull-Up

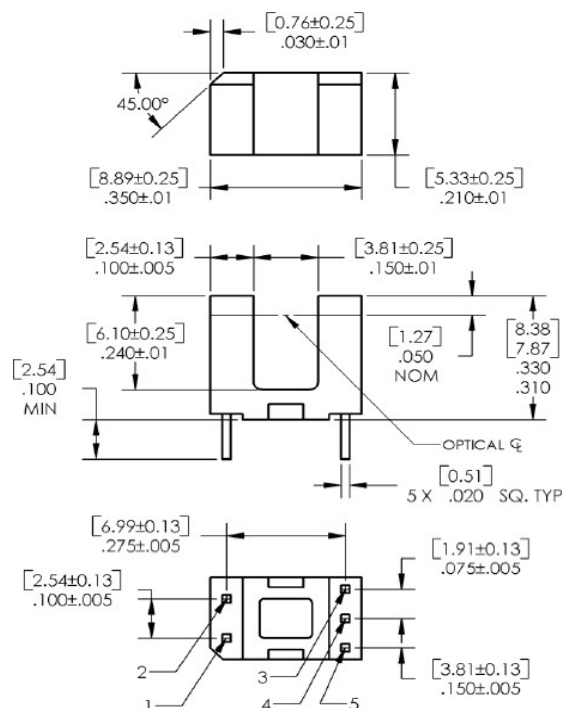


With Light
Output — Low

OPB618/628 Inverted Open-Collector



OPB615, OPB616, OPB618



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

[MILLIMETERS]
DIMENSIONS ARE IN:
INCHES

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OPB615, OPB616, OPB618 Series

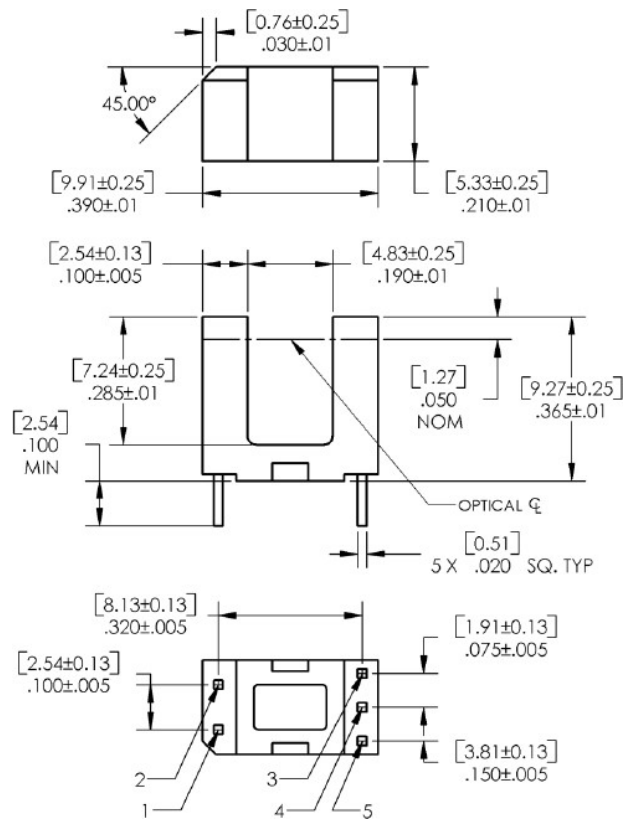
OPB625, OPB626, OPB627, OPB628 Series

OPB665N, OPB666N, OPB667N Series



OPB625, OPB626, OPB627, OPB628

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



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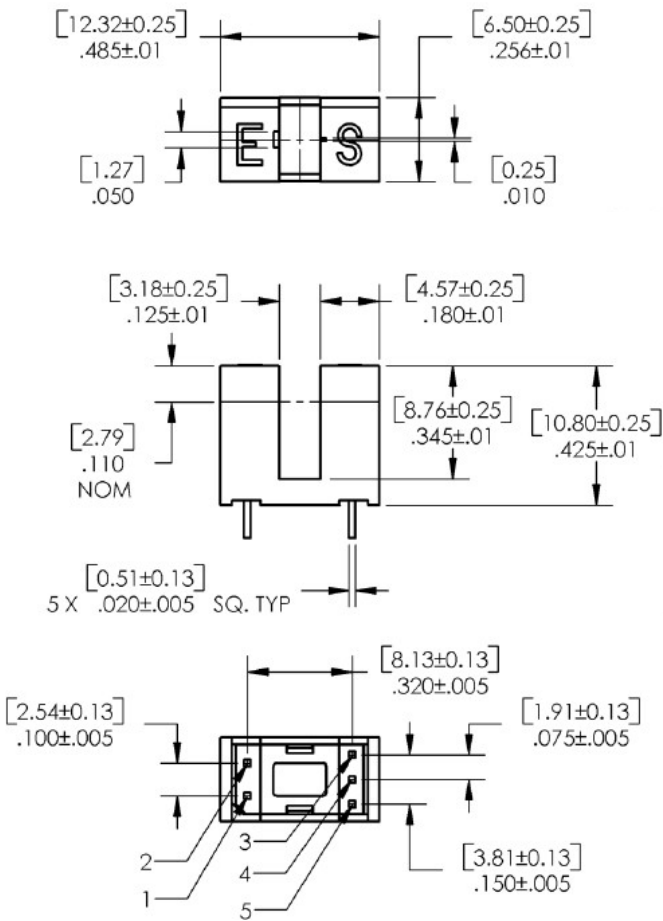
OPB615, OPB616, OPB618 Series

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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Electrical Specifications

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⁾	200 mW

Notes:

- (1) RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering.
- (2) Derate linearly 1.07 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 $I_F = 0\text{ mA}$.
- (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	1.0	-	1.6	V	$I_F = 10\text{ mA}$
I_R	Reverse Current	-	-	100	μA	$V_R = 3\text{ V}$
Output Photologic® Sensor						
V_{CC}	Operating DC Supply Voltage	4.5	-	16	V	
$I_{F(+)}$	LED Positive-Going	0.1	0.55	3	mA	$V_{CC} = 5\text{ V}$
	Threshold Current	0.1	0.6	3		
		0.1	1.6	10		
$I_{F(+)} / I_{F(-)}$	Hysteresis	1.05	1.20	1.90	-	$V_{CC} = 5\text{ V}$

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OPB665N, OPB666N, OPB667N Series



Electrical Specifications

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 OPB615, 625, 665	-	5	12	mA	NO LOAD on Output
	Buffer, Open-Collector OPB616, 626, 666	-	5	12		$I_F = 5 \text{ mA}$
	Inverted, 10k Pull-up OPB618, 627, 667	-	4	12	mA	NO LOAD on Output ⁽⁴⁾
I_{CCL}	Inverted, Open-Collector OPB618, 628	-	4	12		$I_F = 0 \text{ mA}$
	Low Level Supply Current:					
	Buffer, 10k Pull-up OPB615, 625, 665	-	5.5	12	mA	NO LOAD on Output ⁽⁴⁾
	Buffer, Open-Collector OPB616, 626, 666	-	4.0	12		$I_F = 0 \text{ mA}$
	Inverted, 10k Pull-up OPB667	-	6.5	12	mA	NO LOAD on Output, $I_F = 10 \text{ mA}$
V_{OH}	Inverted, 10k Pull-up OPB618, 627	-	6.5	12		NO LOAD on Output, $I_F = 5 \text{ mA}$
	Inverted, Open-Collector OPB618, 628	-	5.0	12		NO LOAD on Output, $I_F = 5 \text{ mA}$
	High Level Output Voltage:					
V_{OH}	Buffer, 10k Pull-up OPB615, 625, 665	$V_{CC}-1.0$	-	-	V	$I_{OH} = 100 \mu\text{A}$, $I_F = 5 \text{ mA}$
	Buffer, Open-Collector OPB616, 626, 666	-	-	-		
	Inverter, 10k Pull-up OPB618, 627, 667	$V_{CC}-1.0$	-	-	V	$I_{OH} = 100 \mu\text{A}$, $I_F = 0 \text{ mA}$ ⁽⁴⁾
I_{OH}	Inverter, Open-Collector OPB618, 628	-	-	-		
	High Level Output Voltage:					
I_{OH}	Buffer, Open-Collector OPB616, 626, 666	-	-	100	μA	$V_{OH} = 30 \text{ V}$, $I_F = 5 \text{ mA}$
	Inverter, Open-Collector OPB618, 628	-	-	100	μA	$I_F = 0 \text{ mA}$ ⁽⁴⁾ , $V_{OH} = 30 \text{ V}$
V_{OL}	Low Level Output Voltage:					
	Buffer, 10k Pull-up OPB615, 625, 665	-	-	0.4	V	$I_{OL} = 16 \text{ mA}$, $V_{CC} = 4.5 \text{ V}$,
	Buffer, Open-Collector OPB616, 626, 666	-	-	0.4		$I_F = 0 \text{ mA}$ ⁽⁴⁾
	Inverter, 10k Pull-up OPB618, 627, 667	-	-	0.4	V	$I_{OL} = 16 \text{ mA}$, $I_F = 5 \text{ mA}$
t_r, t_f	Inverter, Open-Collector OPB618, 628	-	-	0.4		
	Output Rise Time, Output Fall Time	-	30	-	ns	
t_{PLH}	Propagation Delay, Low-High					
	Buffer, 10k Pull-up OPB615, 625, 665	-	0.6	-	μs	
	Buffer, Open-Collector OPB616, 626, 666	-	0.6	-	μs	
	Inverter, 10k Pull-up OPB618, 627, 667	-	3.0	-	μs	
t_{PHL}	Inverter, Open-Collector OPB618, 628	-	3.0	-	μs	
	Propagation Delay, High-Low					
	Buffer, 10k Pull-up OPB615, 625, 665	-	3.0	-	μs	
	Buffer, Open-Collector OPB616, 626, 666	-	3.0	-	μs	
t_{PHL}	Inverter, 10k Pull-up OPB618, 627, 667	-	0.6	-	μs	
	Inverter, Open-Collector OPB618, 628	-	0.6	-	μs	
Data Rate		-	100	-	kHz	$R_L = 300 \Omega$, DC = 50%

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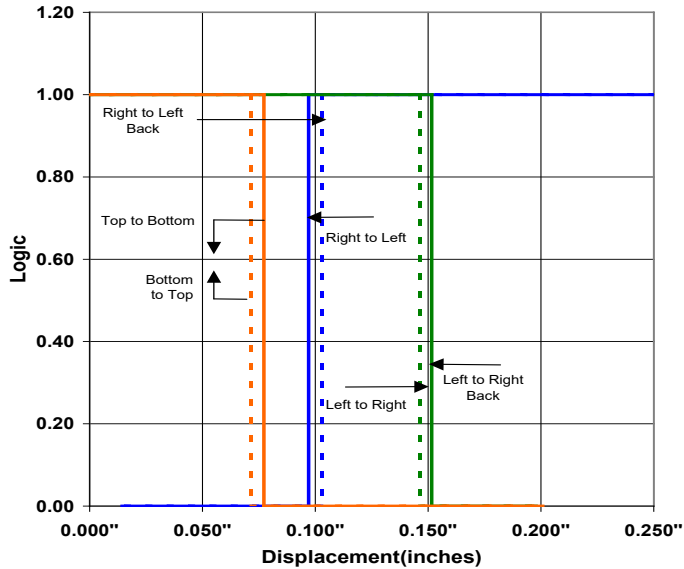
OPB625, OPB626, OPB627, OPB628 Series

OPB665N, OPB666N, OPB667N Series

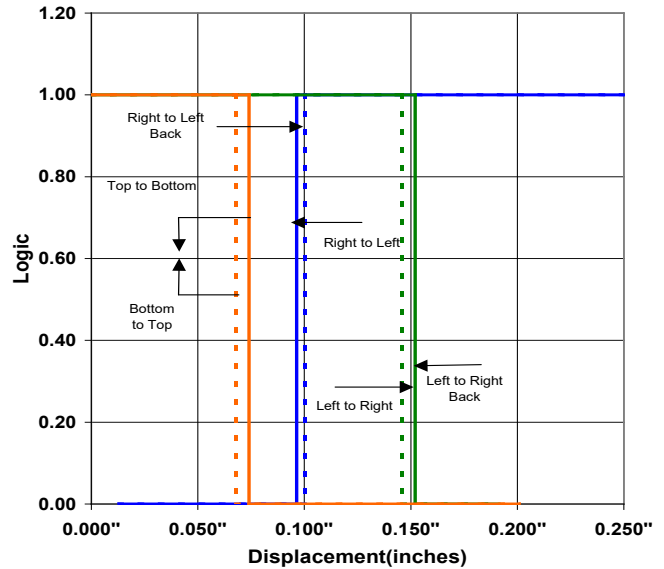


Typical Performance

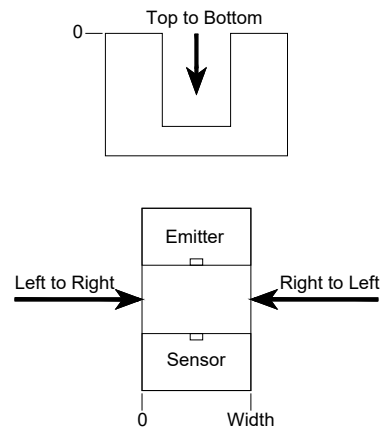
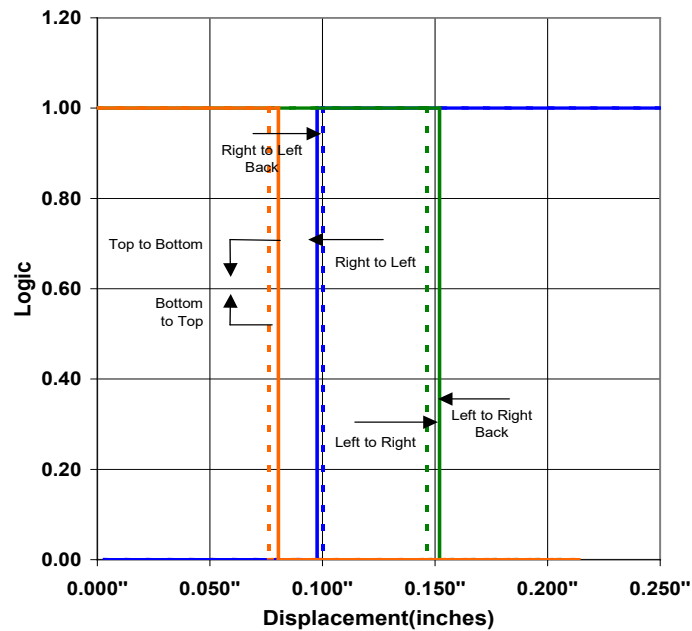
OPB615 - Flag next to Emitter



OPB615 - Flag next to Sensor



OPB615 - Flag in Middle of Slot



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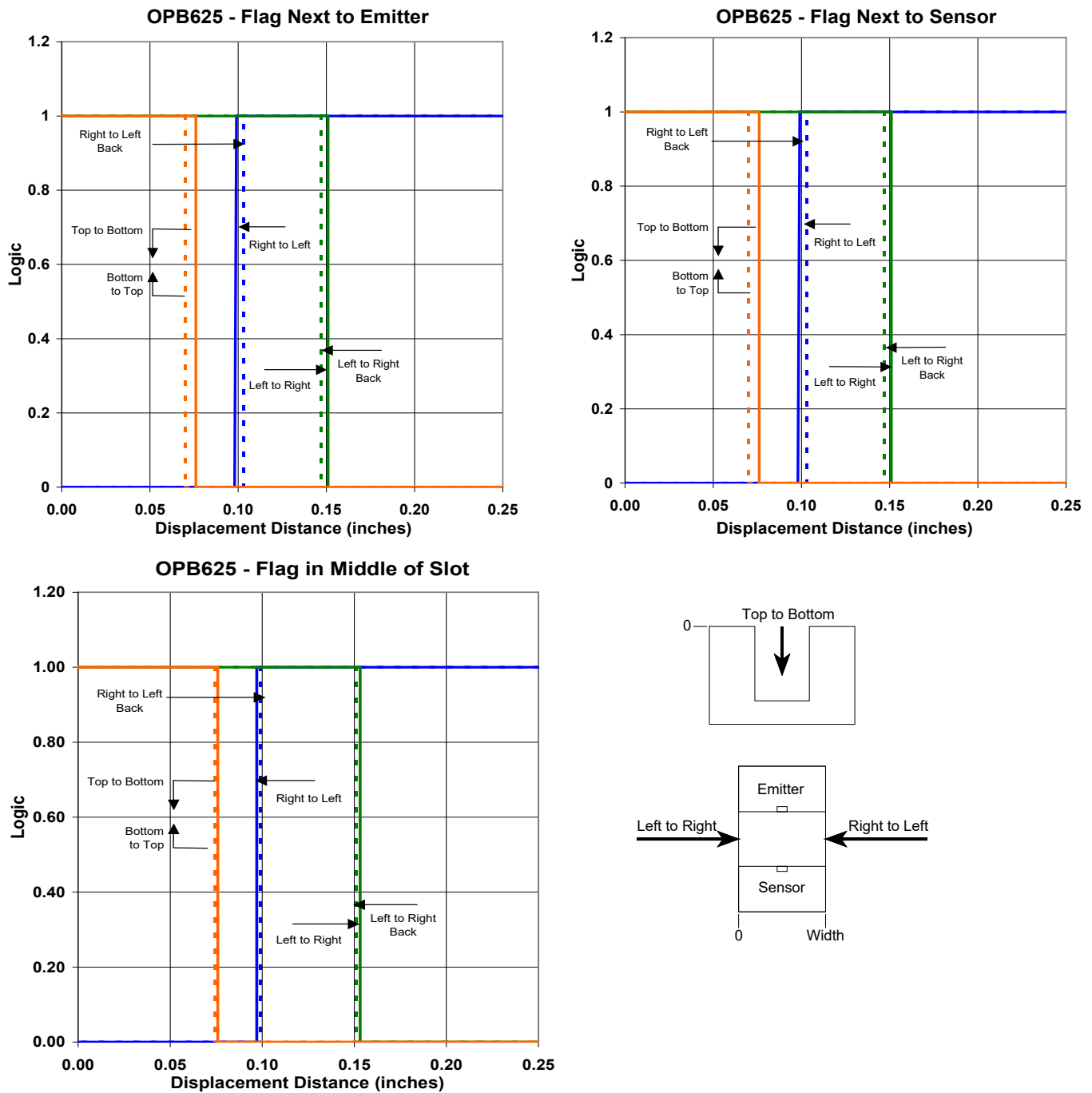
OPB615, OPB616, OPB618 Series

OPB625, OPB626, OPB627, OPB628 Series

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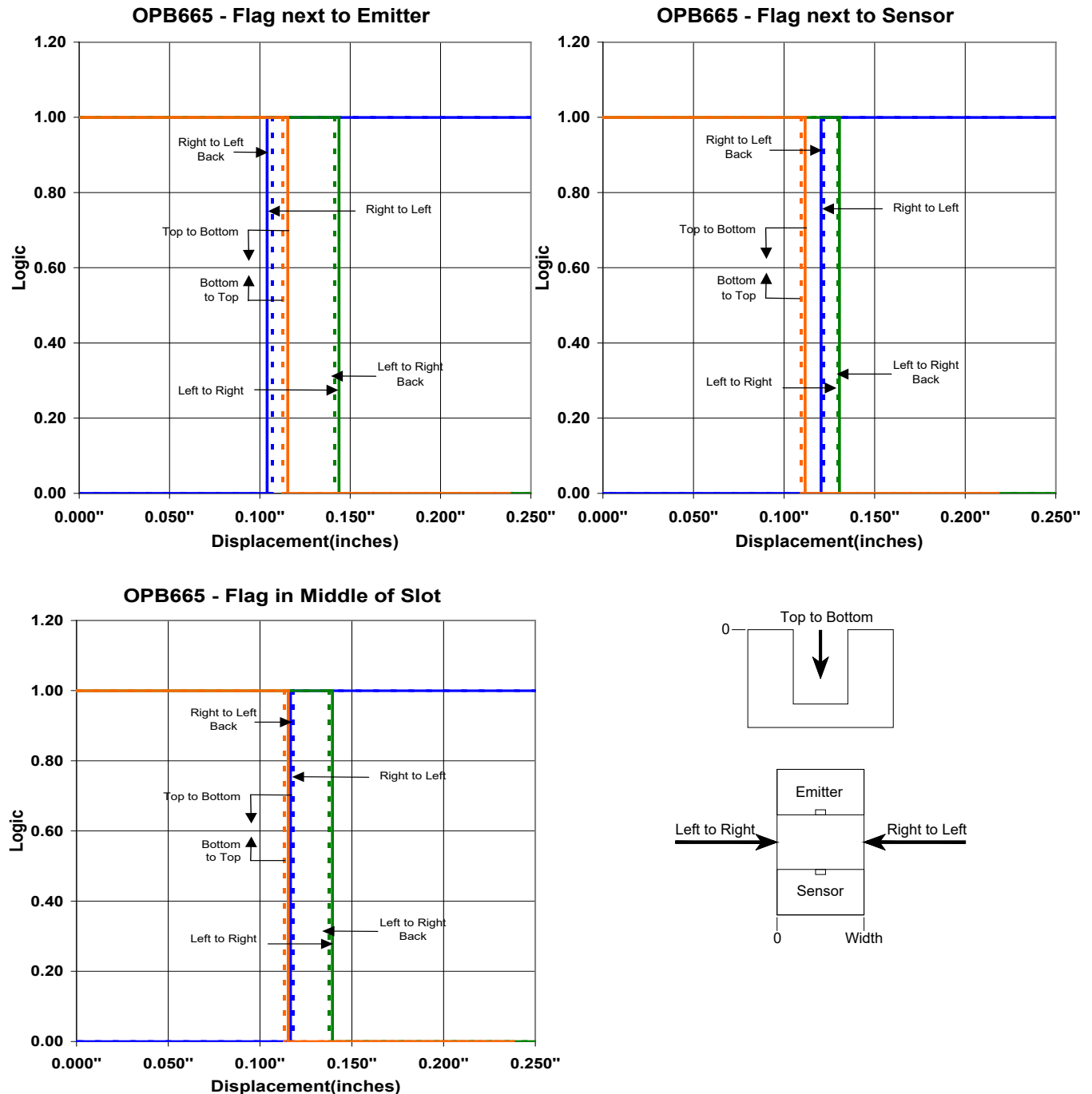
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Typical Performance



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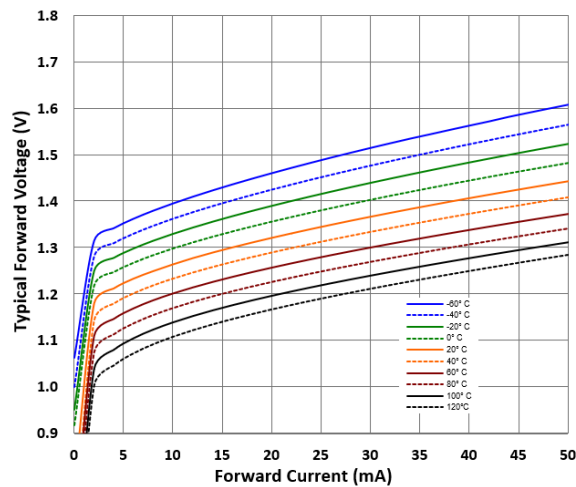
OPB625, OPB626, OPB627, OPB628 Series

OPB665N, OPB666N, OPB667N Series

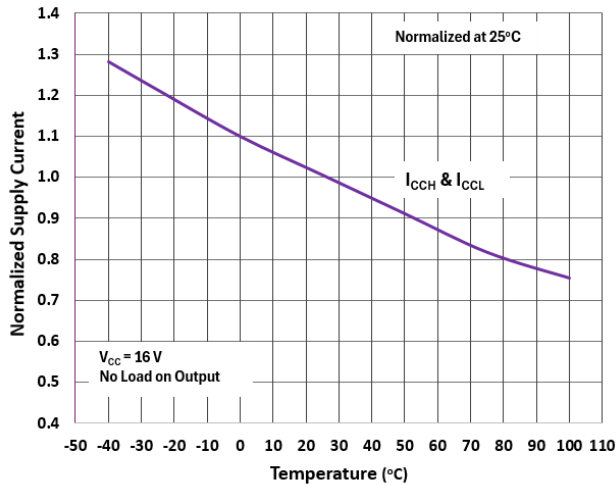


Typical Performance

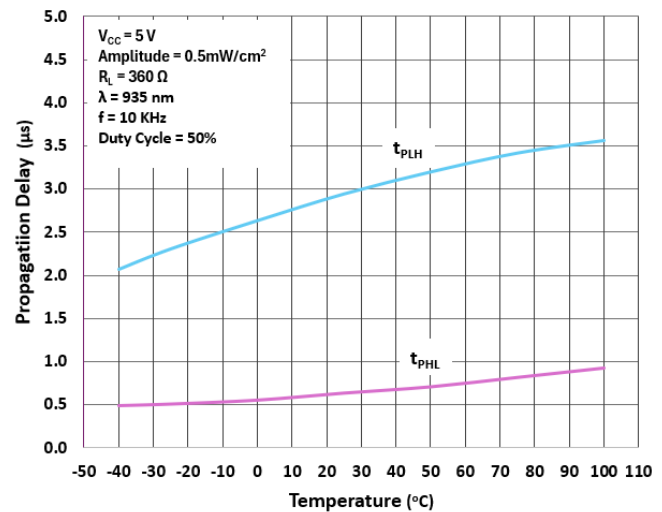
LED Forward Voltage vs I_F vs Temp



Supply Current vs Temperature



Propagation Delay vs Temperature



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