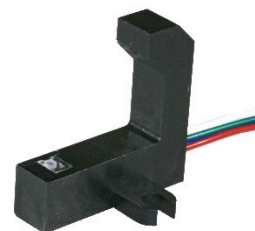


Photologic® Slotted Optical Switch

“Right Angle Package” Series

OPB920DZ



Features:

- Non-contact switching
- Right Angle Sensor: LED in tower, photosensor in base
- Choice of output configuration
- Optical line can be broken in three axis
- 24" minimum, #26 AWG UL rated wires

Description:

The **OPB920** series optical switch consists of an infrared emitting diode (LED) and a Photologic® sensor. The LED is mounted on the tower with the Photologic® sensor mounted on the base of a right-angle shape package. The L-Shape or right-angle package configuration allows for an opaque object to block the light beam from a multitude of directions including the X-axis Y-axis and Z-axis. The optical center line between the emitter and photosensor is at 45° from the mounting base of the device.

The OPB920 Series provides optimum flexibility for the design engineer. The engineer can specify the type of TTL output. For example, the output can be: TTL totem pole, TTL open collector, either of which can be buffered or inverted output.

All versions have the added stability of hysteresis built into the circuitry.

Custom electrical, wire and cabling and connectors are available. Contact your local representative or OPTEK for more information.

Applications:

- Non-contact interruptive object sensing
- Tray-out sensor
- Amusement gaming equipment
- Low paper tray sensor
- Paper sorting equipment
- Corner sensor
- Printers
- Copying machines
- Door sensor
- Optical Switch

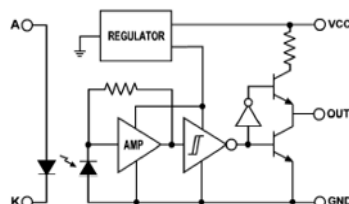
Part Number Guide — OPB920xZ Series

OPB920 Z

A = Totem Pole
B = Open Collector
C = Inverted Totem Pole
D = Inverted Open Collector

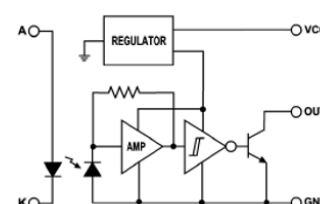
All versions with #26 AWG wire termination (24" [61cm] long)

Totem-Pole Output

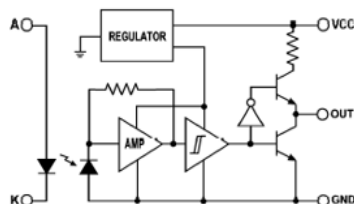


Light - On
Output - High

Open-Collector Output

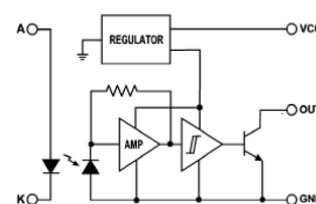


Totem-Pole Inverted Output



Light - On
Output - Low

Open-Collector Inverted Output



General Note

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OPB920DZ



Technical drawing of the OPB920xZ Datecode sensor assembly, showing dimensions in inches and millimeters.

Top View Dimensions:

- 4X 24" [610] 26 AWG UL Approved (Wire)
- Red, Green, Blue, White (Wire Colors)
- 2X R0.062 [R1.59] (Radius)
- 2X R0.125 [R3.17] (Radius)
- 0.250 [6.35] (Dimension)
- 0.125 [3.17] (Dimension)
- Optical $\varnothing$ (Optical Axis)
- 0.427 [10.84] (Dimension)
- 0.305 [7.75] (Dimension)
- Optical $\varnothing$ (Optical Axis)
- 0.227 [5.77] (Dimension)
- 0.610 [15.49] (Dimension)

Side View Dimensions:

- 1.010 [25.65] (Dimension)
- 0.338 [8.59] (Dimension)
- 0.211 [5.35] (Dimension)
- 0.984 [24.99] (Dimension)
- 45°X Ref. (Reference Angle)
- Optical $\varnothing$ (Optical Axis)
- 0.143 [3.63] (Dimension)
- 0.260 [6.60] (Dimension)
- 0.307 [7.80] (Dimension)
- 0.100 [2.54] (Dimension)
- 0.827 [20.99] (Dimension)

Detail View Dimensions:

- 0.200 [5.08] (Dimension)
- 0.307 [7.80] (Dimension)

Labels:

- MEXICO
- OPB920xZ DATECODE

Note: Dimensions are in inches [mm]
Tolerances +/- 0.010" [0.25mm]

Electrical Specifications

Storage Temperature	-40° C to +85° C
Operating Temperature	-40° C to +70° C
Lead Soldering Temperature (1/16" (1.6 mm) from case for 5 seconds with soldering iron) ^(4, 5)	260° C
Input Infrared LED	
DC Forward Diode (LED) Current	40 mA
DC Reverse Diode (LED) Voltage	2 V
Input Diode Power Dissipation ⁽¹⁾	100 mW
Output Photologic®	
Supply Voltage, V _{CC} (not to exceed 3 seconds)	18 V
Voltage at Output Lead (Open Collector Output version)	35 V
Output Photologic® Power Dissipation ⁽²⁾	200 mW
Total Device Power Dissipation ⁽³⁾	300 mW

- (1) Derate linearly 1.77 mW/° C above 25° C
- (2) Derate linearly 2.66 mW/° C above 25° C
- (3) Derate linearly 4.43 mW/° C above 25° C
- (4) RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering.
- (5) Methanol or isopropanol are recommended as cleaning agents. The plastic housing is soluble in chlorinated hydrocarbons and ketones.

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Photologic® Slotted Optical Switch

“Right Angle Package” Series

OPB920DZ



Electrical Specifications

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	-	1.7	V	$I_F = 20\text{ mA}$, $T_A = 25^\circ\text{C}$
I_R	Reverse Current	-	-	100	μA	$V_R = 2\text{ V}$, $T_A = 25^\circ\text{C}$
Output Photologic® Sensor						
V_{CC}	Operating D.C. Supply Voltage	4.5	-	16	V	
I_{CCL}	Low Level Supply Current: Buffered Totem-Pole Output ⁽¹⁾ Buffered Open-Collector Output ⁽¹⁾	-	-	15	mA	$V_{CC} = 16.0\text{ V}$, $I_F = 0\text{ mA}$
	Inverted Totem-Pole Output Inverted Open-Collector Output					$V_{CC} = 16.0\text{ V}$, $I_F = 20\text{ mA}$
I_{CCH}	High Level Supply Current: Buffered Totem-Pole Output Buffered Open-Collector Output	-	-	15	mA	$V_{CC} = 16.0\text{ V}$, $I_F = 20\text{ mA}$
	Inverted Totem-Pole Output ⁽¹⁾ Inverted Open-Collector Output ⁽¹⁾					$V_{CC} = 16.0\text{ V}$, $I_F = 0\text{ mA}$
V_{OL}	Low Level Supply Current: Buffered Totem-Pole Output ⁽¹⁾ Buffered Open-Collector Output ⁽¹⁾	-	-	0.4	V	$V_{CC} = 4.5\text{ V}$, $I_{OL} = 16\text{ mA}$, $I_F = 0\text{ mA}$
	Inverted Totem-Pole Output Inverted Open-Collector Output					$V_{CC} = 4.5\text{ V}$, $I_{OL} = 16\text{ mA}$, $I_F = 20\text{ mA}$
V_{OH}	High Level Output Voltage: Buffered Totem-Pole Output	$V_{CC} - 2.1$	-	-	V	$V_{CC} = 4.5\text{ V}$, $I_{OH} = -800\text{ }\mu\text{A}$, $I_F = 20\text{ mA}$
	Inverted Totem-Pole Output ⁽¹⁾					$V_{CC} = 4.5\text{ V}$, $I_{OH} = -800\text{ }\mu\text{A}$, $I_F = 0\text{ mA}$
I_{OH}	High Level Output Current: Buffered Open-Collector Output	-	-	100	μA	$V_{CC} = 4.5\text{ V}$, $V_{OH} = 30\text{ V}$, $T_A = 25^\circ\text{C}$
	Inverted Open-Collector Output					
$I_{F(+)}$	LED Positive-Going Threshold Current	-	-	20	mA	$V_{CC} = 5\text{ V}$, $T_A = 25^\circ\text{C}$
$I_{F(+)} / I_{F(-)}$	Hysteresis	-	1.5	2	-	$V_{CC} = 5\text{ V}$
$t_r, t_f^{(2)}$	Output Rise Time, Output Fall Time	-	70	-	ns	$V_{CC} = 5\text{ V}$, $T_A = 25^\circ\text{C}$ $I_F = 0\text{ or }20\text{ mA}$
$t_{PLH}, t_{PHL}^{(2)}$	Propagation Delay Low-High and High-Low	-	5	-	μs	$R_L = 8\text{ TTL Loads (Totem-Pole)}$ $R_L = 360\text{ }\Omega\text{ (Open-Collector)}$

Notes:

- (1) Normal application would be with light source blocked, simulated by $I_F = 0\text{ mA}$.
- (2) By design not tested.

General Note

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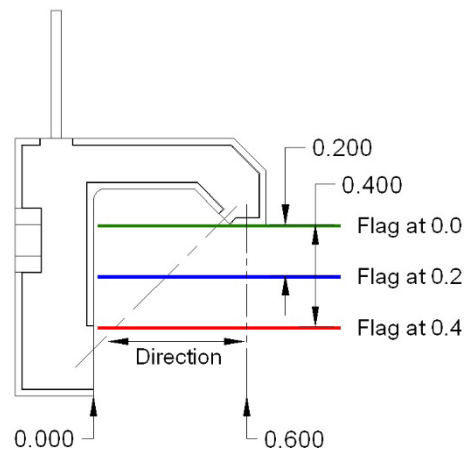
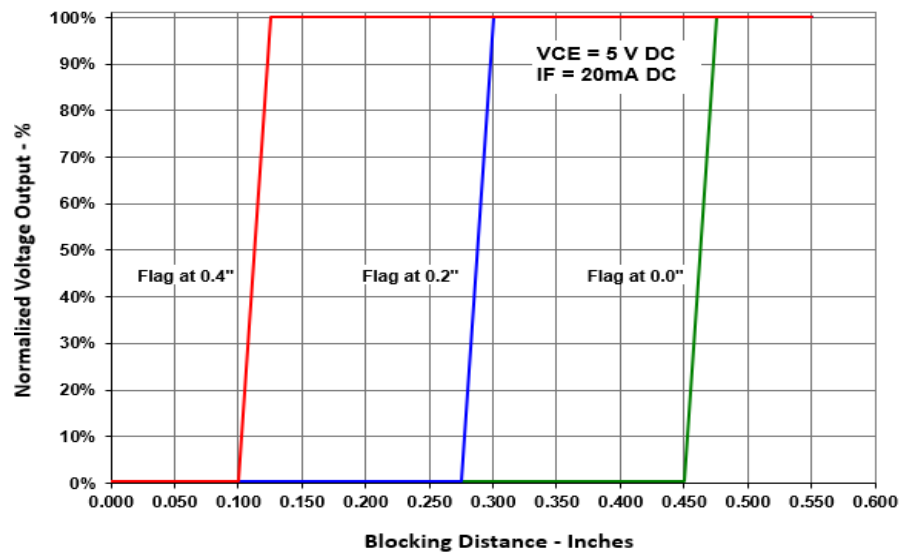
Photologic® Slotted Optical Switch “Right Angle Package” Series

OPB920DZ



Typical Performance

Typical Voltage Output Vs Blocking Distance
(Y-Axis Blocked)



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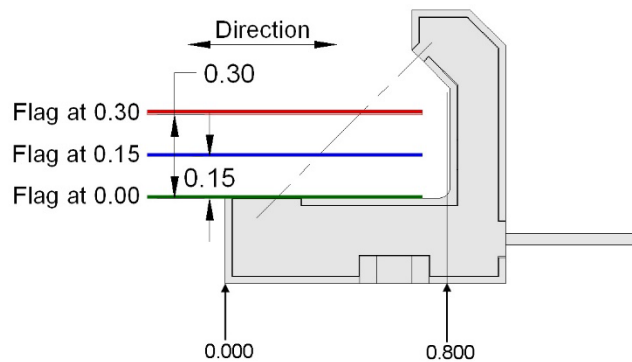
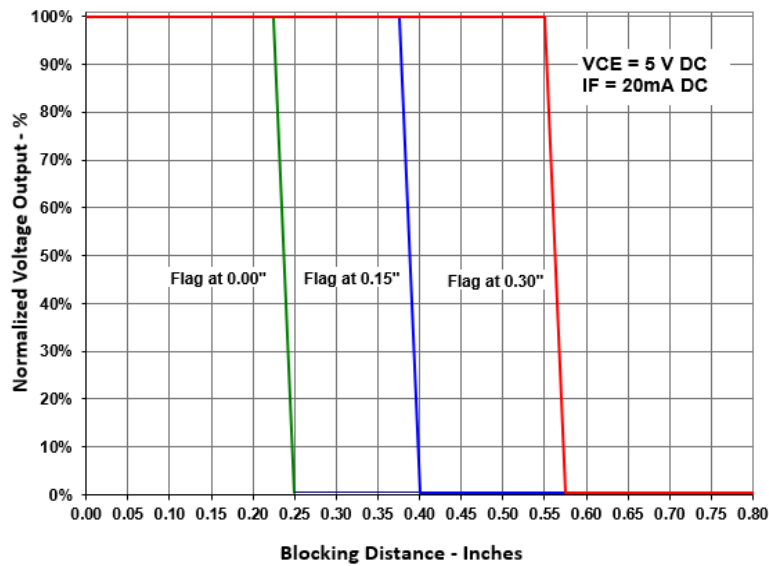
Photologic® Slotted Optical Switch “Right Angle Package” Series

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Typical Performance

Typical Voltage Output Vs Blocking Distance
(X-Axis Blocked)



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Photologic® Slotted Optical Switch

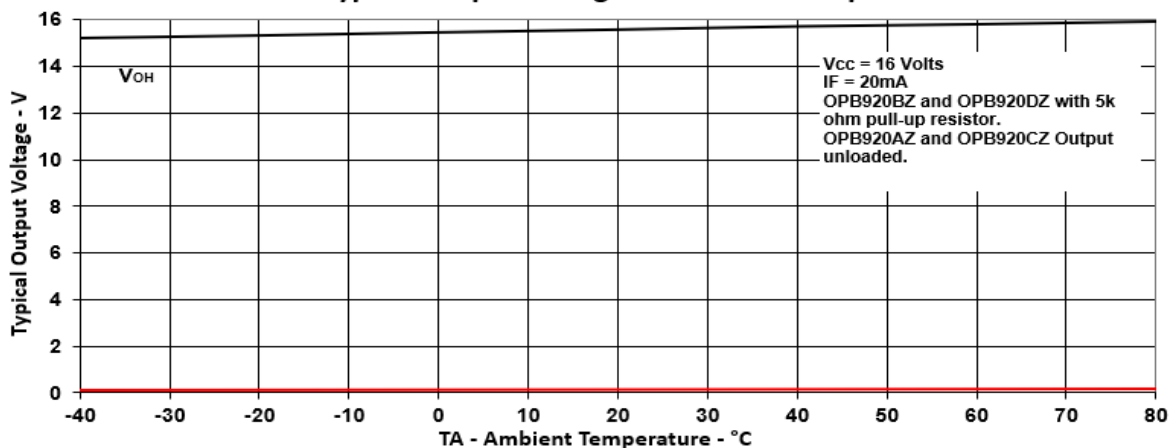
“Right Angle Package” Series

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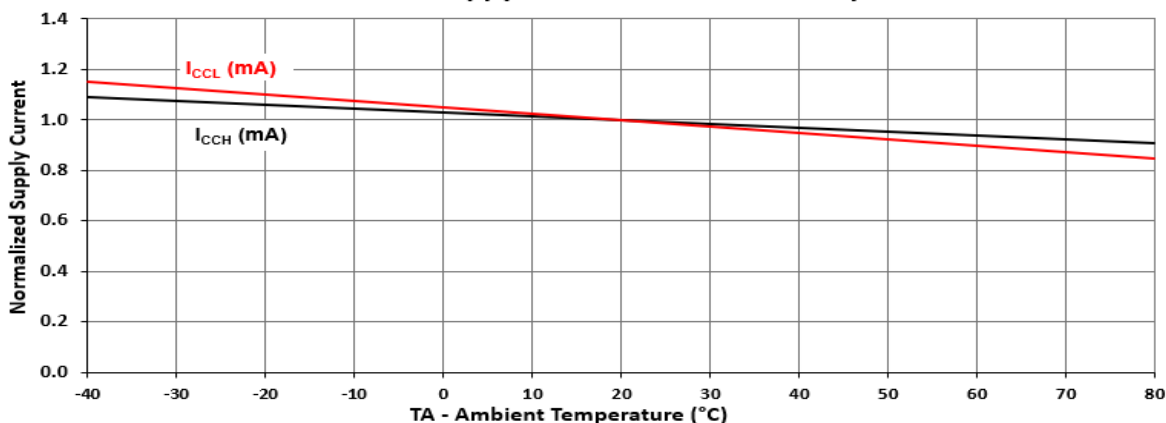


Typical Performance

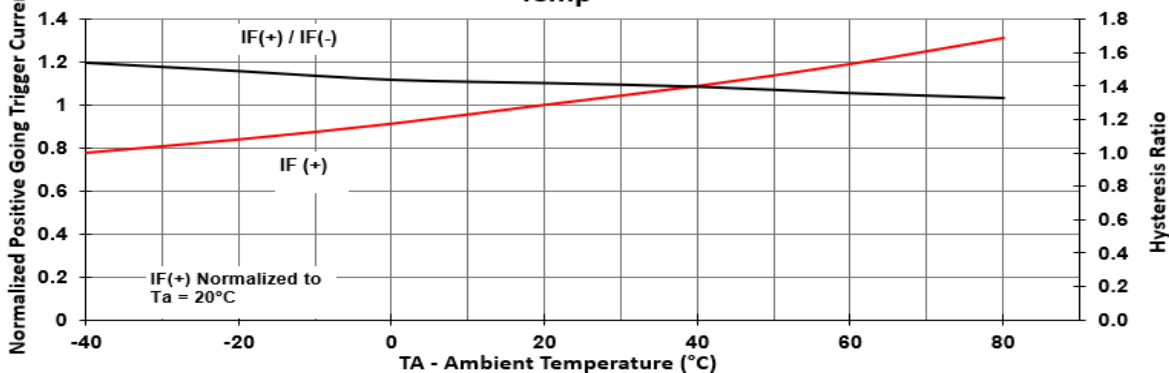
Typical Output Voltage Vs Ambient Temperature



Normalized Supply Current Vs Ambient Temperature



Normalized Positive Going Trigger Current and Hysteresis Vs Ambient Temp



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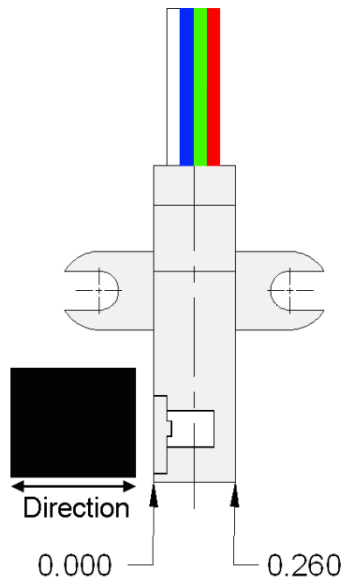
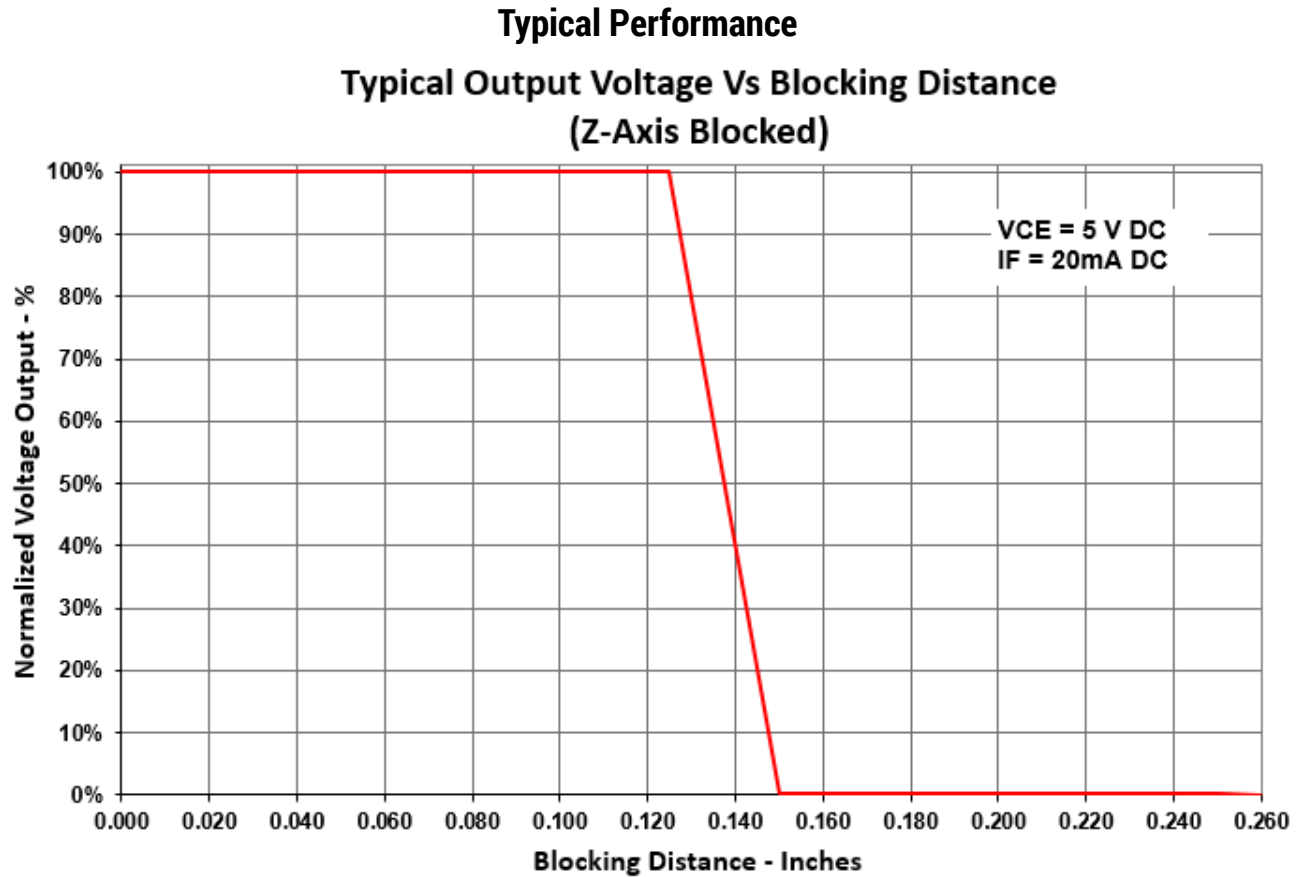
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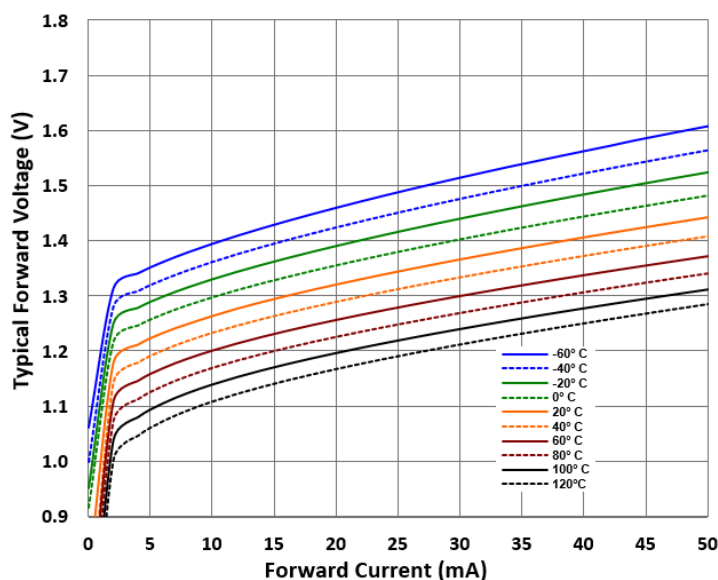
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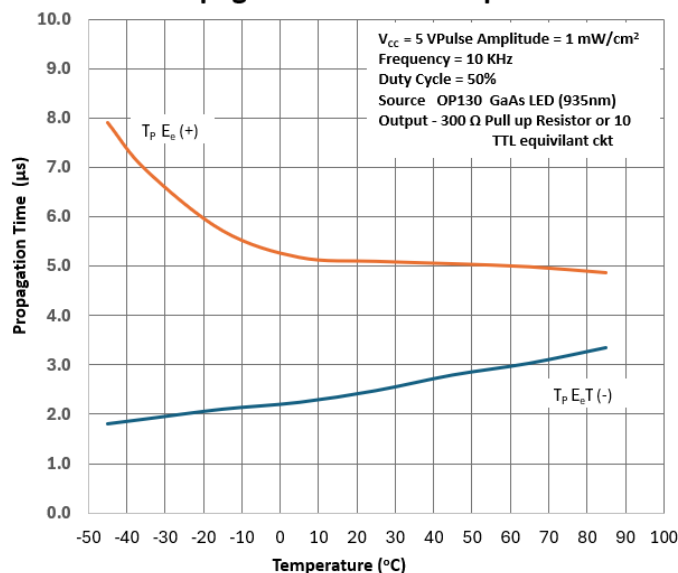


Typical Performance

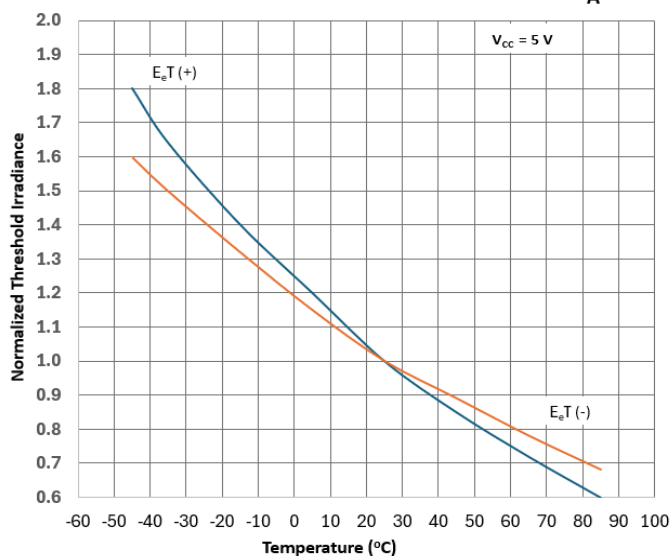
LED Forward Voltage vs I_F vs Temperature



Propagation Time vs Temperature



Normalized Threshold Irradiance vs T_A



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