# Photologic® Reflective Object Sensor

## OPB760, OPB761, OPB762, OPB763 (Series N and T)

## OPB770, OPB771, OPB772, OPB773 (Series NZ and TZ)

TT electronics
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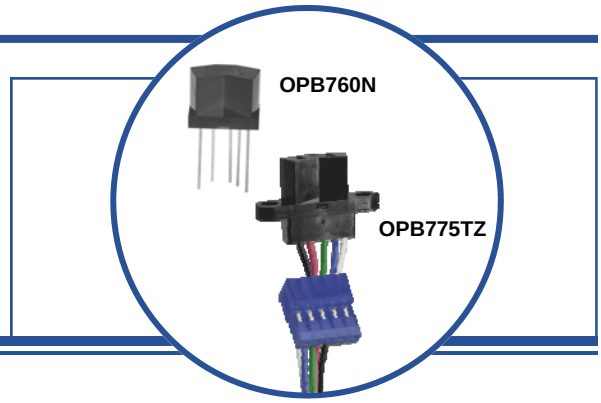
### Features:

- Choice of mounting configurations
- Choice of four output configurations
- .040” (10.160 mm) PCBoard mount (N and T series)
- 12” (304.800 mm) AWG 26 wires (NZ and TZ series)




### Description:

The **OPB760N**, **OPB760T**, **OPB770N** and **OPB770T** series of reflective assemblies feature Photologic® output. The electrical output can be specified as either TTL Totem-Pole or TTL Open-Collector, either of which can be supplied with inverter or buffer output polarity.

**OPB760N** and **OPB760T** series devices are designed for PCBoard mounting and have 0.04” (10 mm) long leads. **OPB770N** and **OPB770T** series devices are designed for remote mounting with two mounting tags and have 12” (305 mm) long, UL approved 26 AWG wires.

All devices in this series offer the added stability of a built-in hysteresis amplifier.

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

### Applications:

- Non-contact Photologic® reflective object sensor
- Assembly line automation
- Machine automation
- Machine safety
- End of travel sensor
- Door sensor

**Ordering Information**

| Part Number | LED Peak Wavelength | Sensor Photologic® | Reflection Distance (Inch) Min / Max | Mounting |
|---|---|---|---|---|
| **OPB760N** | 890 nm | Totem-Pole | 0.080" / 0.220” | PCBoard .40” (10.160 mm) leads) |
| **OPB761N** | | Open Collector | | |
| **OPB762N** | | Inv-Totem-Pole | | |
| **OPB763N** | | Inv-Open Collector | | |
| **OPB760T** | | Totem-Pole | | |
| **OPB761T** | | Open Collector | | |
| **OPB762T** | | Inv-Totem-Pole | | |
| **OPB763T** | | Inv-Open Collector | | |
| **OPB770NZ** | | Totem-Pole | | 12” (304.800 mm) 26 AWG wire |
| **OPB771NZ** | | Open Collector | | |
| **OPB772NZ** | | Inv-Totem-Pole | | |
| **OPB773NZ** | | Inv-Open Collector | | |
| **OPB770TZ** | | Totem-Pole | | |
| **OPB771TZ** | | Open Collector | | |
| **OPB772TZ** | | Inv-Totem-Pole | | |
| **OPB773TZ** | | Inv-Open Collector | | |

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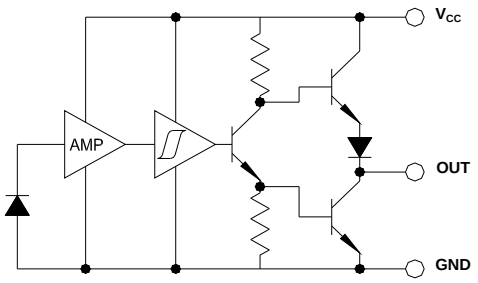
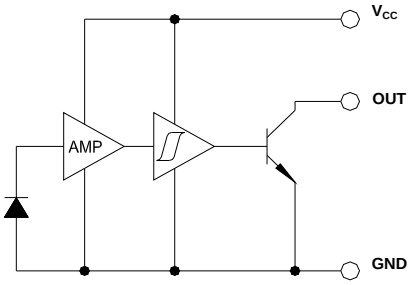
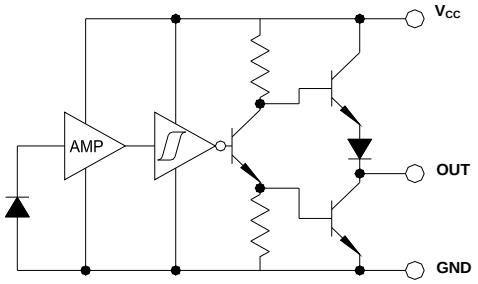
### OPB760, OPB770 Buffered Totem-Pole



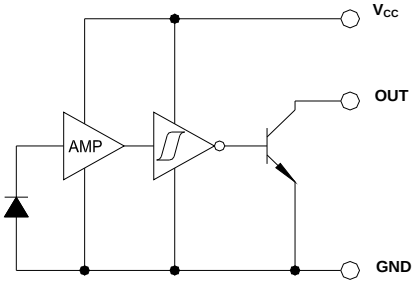

### OPB761, OPB771 Buffered Open Collector



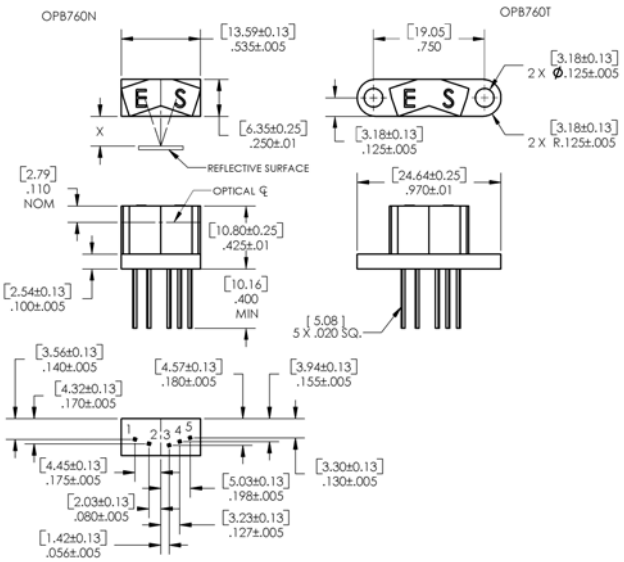

### OPB762, OPB772 Inverted Totem-Pole



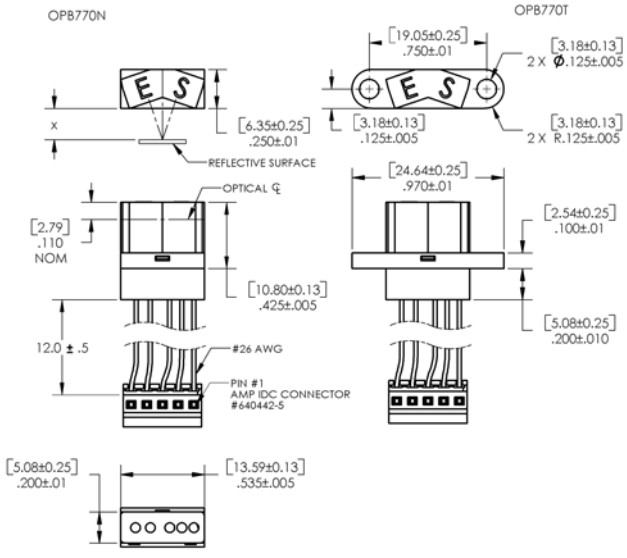

### OPB763, OPB773 Inverted Open-Collector




### OPB760 (N and T Series)




### OPB770 (NZ and TZ Series)




X = 0.08" [2.0mm] to 0.22" [5.6mm]

DIMENSIONS ARE IN: [ MILLIMETERS ] INCHES

| Pin # | Description | Pin# | Description |
|---|---|---|---|
| 1 | Cathode | 3 | Ground |
| 2 | Anode | 4 | Output |
| | | 5 | $V_{CC}$ |

| Color/Pin# | Description | Color/Pin# | Description |
|---|---|---|---|
| Red-4 | Anode | White-1 | $V_{CC}$ |
| Black-5 | Cathode | Blue-2 | Output |
| | | Green-3 | Ground |

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### Absolute Maximum Ratings ($T_A$=25°C unless otherwise noted)

| | |
|---|---|
| Supply Voltage, $V_{CC}$ (not to exceed 3 seconds) | 10 V |
| Storage Temperature Range | -40° C to +85° C |
| Operating Temperature Range | -40° C to +70° C |
| Lead Soldering Temperature (1/16" inch (1.6 mm) from case for 5 seconds with soldering iron)(1) | 260° C |
| Input Diode Power Dissipation(2) | 100 mW |
| Output Photologic® Power Dissipation(3) | 200 mW |
| Total Device Power Dissipation(4) | 300 mW |
| Voltage at Output Lead (Open Collector Output) | 35 V |
| Diode Forward DC Current | 40 mA |
| Diode Reverse DC Voltage | 3 V |

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

| SYMBOL | PARAMETER | MIN | TYP | MAX | UNITS | TEST CONDITIONS |
|---|---|---|---|---|---|---|
| **Input Diode** | | | | | | |
| $V_F$ | Forward Voltage | - | - | 1.8 | V | $I_F$ = 40 mA, $T_A$ = 25° C |
| $I_R$ | Reverse Current | - | - | 100 | µA | $V_R$ = 2.0 V, $T_A$ = 25° C |
| **Output Photologic® Sensor** | | | | | | |
| $V_{CC}$ | Operating DC Supply Voltage | 4.75 | - | 5.25 | V | |
| $I_{CCL}$ | Low Level Supply Current:<br>Buffered Totem-Pole Output(5)(6)<br>Buffered Open-Collector Output(5)(6) | <br>-<br>- | <br>-<br>- | <br>10<br>10 | <br>mA<br>mA | Vcc = 5.25 V, If = 0 mA (output open) |
| | Inverted Totem-Pole Output(5)<br>Inverted Open-Collector Output(5) | -<br>- | -<br>- | 10<br>10 | mA<br>mA | Vcc = 5.25 V, If = 0 mA (output open) |
| $I_{CCH}$ | High Level Supply Current:<br>Buffered Totem-Pole Output(5)(6)<br>Buffered Open-Collector Output(5) | <br>-<br>- | <br>-<br>- | <br>10<br>10 | <br>mA<br>mA | Vcc = 5.25 V, If = 25 mA (output open) |
| | Inverted Totem-Pole Output(5)(6)<br>Inverted Open-Collector Output(5)(6) | -<br>- | -<br>- | 10<br>10 | mA<br>mA | Vcc = 5.25 V, If = 0 mA (output open) |
| $I_{OH}$ | High Level Output Voltage:<br>Buffered Open-Collector Output | <br>- | <br>- | <br>100 | <br>µA | Vcc = 4.5 V, If = 25 mA, $V_{OH}$ = 30 V, $T_A$=25°C |
| | Inverted Open-Collector Output | - | - | 100 | µA | Vcc = 4.5 V, If = 0 mA, $V_{OH}$ = 30 V, $T_A$ = 25°C |

Notes:
(1) RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering.
(2) Derate linearly 2.22 mW/°C above 25° C.
(3) Derate linearly 4.44 mW/°C above 25° C.
(4) Derate linearly 6.66 mW/°C above 25° C.Normal application would be with light source blocked, simulated by $I_F$=0 mA.
(5) Tested at d = 0.080" (mm) from a 90% diffuse white test surface.
(6) Normal application would be with light source blocked, simulated by $I_F$ = 0 mA.
(7) All parameters tested using pulse technique.

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

| SYMBOL | PARAMETER | MIN | TYP | MAX | UNITS | TEST CONDITIONS |
|---|---|---|---|---|---|---|
| **Output Photologic® Sensor** (continued) | | | | | | |
| $I_{F(+)}$ | LED Positive-Going Threshold Current(2) | - | - | 25 | mA | Vcc = 5 V, $T_A$ = 25° C |
| $I_{F(+)}/I_{F(-)}$ | Hysteresis(2) | 1.1 | - | 2.0 | - | Vcc = 5 V |
| $I_{OS}$ | Short Circuit Output Current:<br>Buffered Totem-Pole Output(1) | -15 | - | -100 | mA | If = 25 mA, Vcc = 5.25 V, Output = GRD |
| | Inverted Totem-Pole Output(1) | -15 | - | -100 | mA | If = 0 mA, Vcc = 5.25 V, Output = GRD |
| $V_{OL}$ | Low Level Output Voltage:<br>Buffered Totem-Pole Output(1)(4)<br>Buffered Open-Collector Output(1)(4) | -<br>- | -<br>- | 0.4<br>0.4 | V<br>V | $V_{CC}$ = 4.5 V, $I_{OL}$ = 12.8 mA, $I_F$ = 0 mA or $I_F$ = 30 mA |
| | Inverted Totem-Pole Output<br>Inverted Open-Collector Output(1)(4) | -<br>- | -<br>- | 0.4<br>0.4 | V<br>V | $V_{CC}$ = 4.5 V, $I_{OL}$ = 12.8 mA, $I_F$ = 25 mA |
| $V_{OH}$ | High Level Output Voltage:<br>Buffered Totem-Pole Output(1) | 2.4 | - | - | V | $V_{CC}$ = 4.5 V, $I_{OH}$ = -800 µA, $I_F$ = 25 mA |
| | Inverted Totem-Pole Output(1)(4) | 2.4 | - | - | V | $V_{CC}$ = 4.5 V, $I_{OH}$ = -800 µA, $I_F$ = 0 mA |
| | Inverted Totem-Pole Output (3)<br>Inverted Open-Collector Output(3) | 2.4<br>2.4 | -<br>- | -<br>- | V<br>V | $V_{CC}$ = 4.5 V, $I_{OL}$ = -800 µA, $I_F$ = 30 mA |

Notes:
(1) Tested at d = 0.080” (mm) from a 90% diffuse white test surface.
(2) Tested at d = 0.080” (mm), 0.150” (mm) and 0.220” (mm) from a 90% diffuse white test surface. Reference: Eastman Kodak, Catalog #E 152 7795.
(3) Tested at d = 0.080” (mm), 0.150” (mm) and 0.220” (mm) from a 5% diffuse black test surface.
(4) Normal application would be with light source blocked, simulated by $I_F$=0 mA.
(5) OPB760N through OPB763N series devices are terminated with 0.20” (mm) square leads designed for printed PCBoard mounting.
(6) OPB770NZ through OPB773NZ series devices are terminated with 12 inches (mm) of 7-strand 26 AWG UL1429 insulated wire on each terminal. A standard AMP No. 640442-5 connector has been attached to the lead wires to ease connection to wire harnesses.
(7) OPB760T through OPB763T series devices are terminated with 0.020” (mm) square leads designed for printed PCBoard mounting.
(8) OPB770TZ through OPB773TZ series are terminated with 12” (mm) of 7-strand 26 AWG UL1429 insulated wire on each terminal. A standard AMP No. 640442-5 connector has been attached to the lead wires to ease connection to wire harnesses.
(9) All parameters tested using pulse technique.

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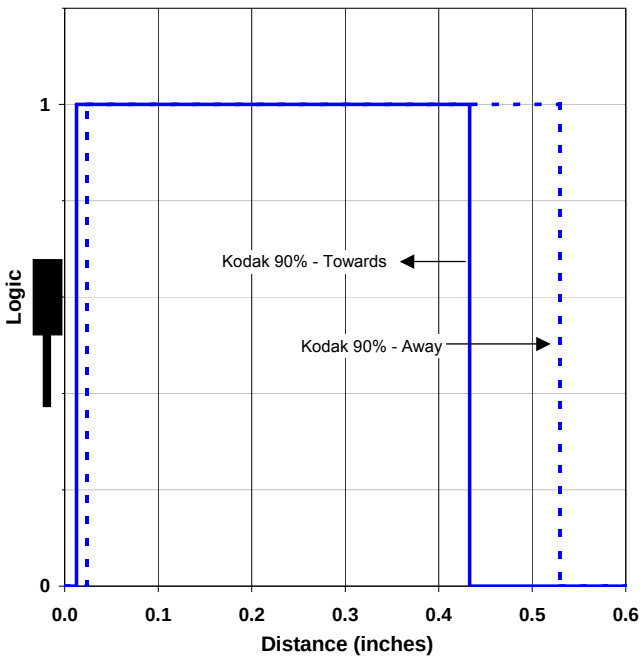
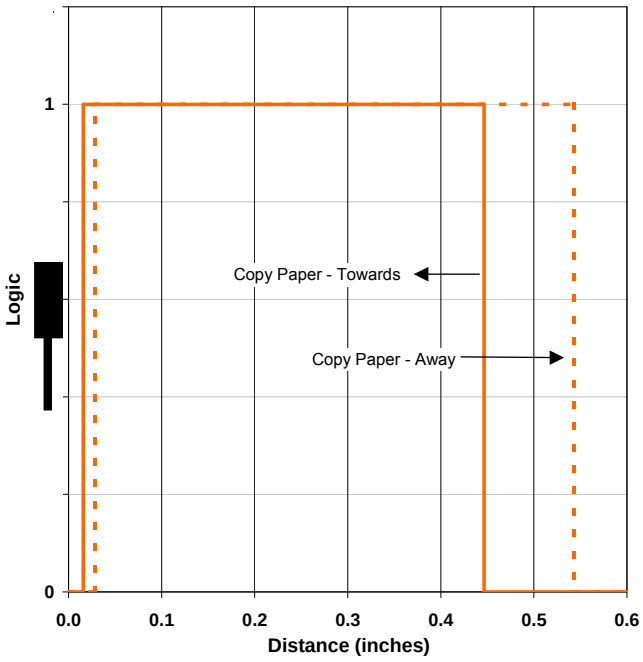
**Logic Level vs Distance**




**Logic Level vs Distance**

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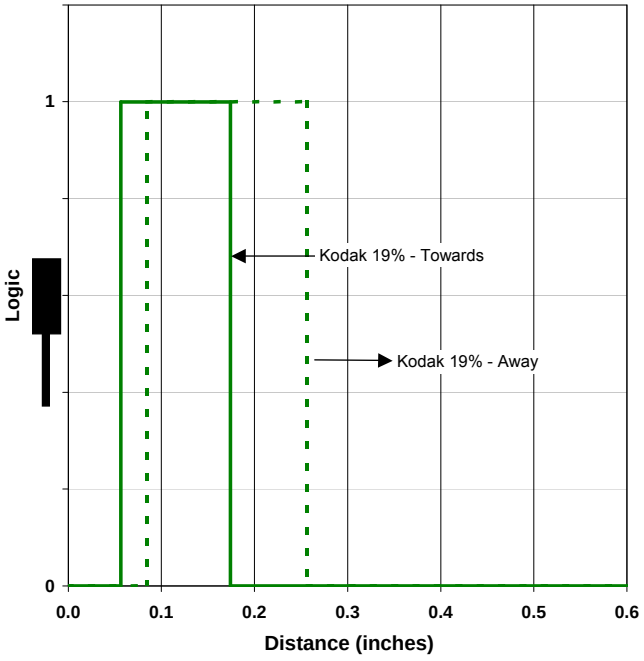
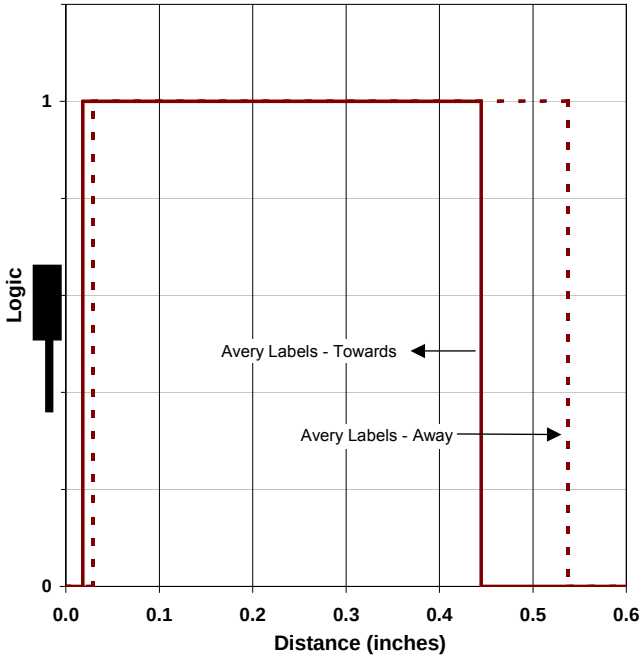



**Logic Level vs Distance**

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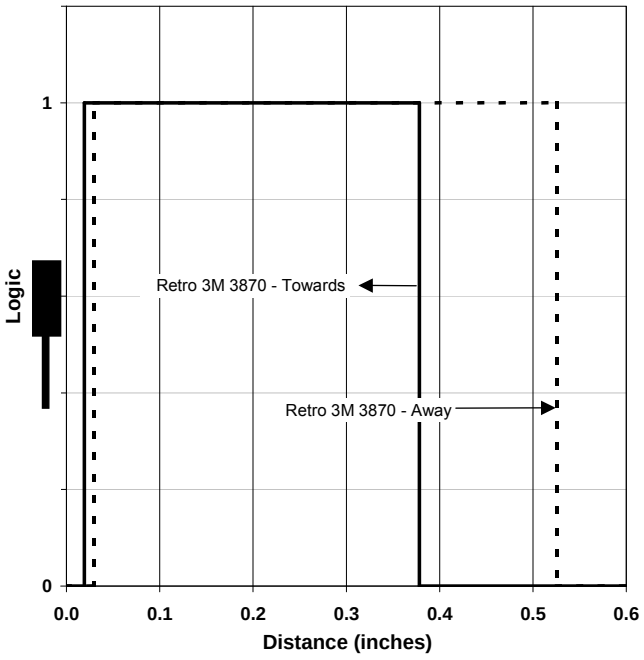
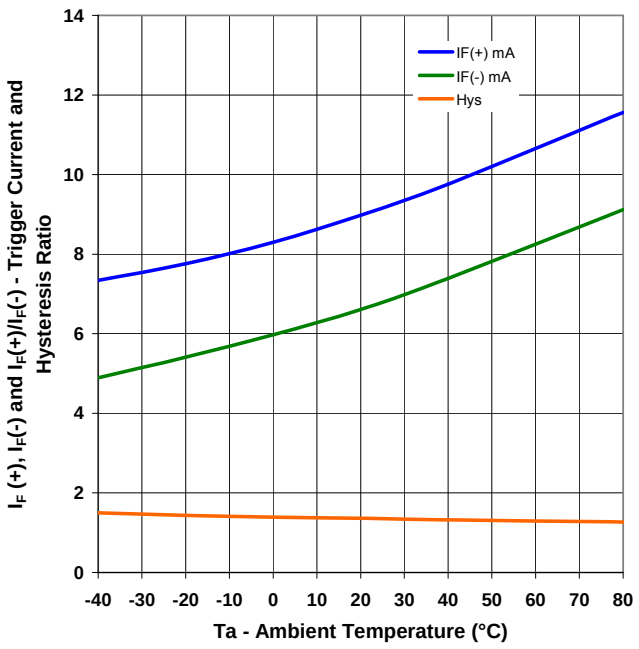
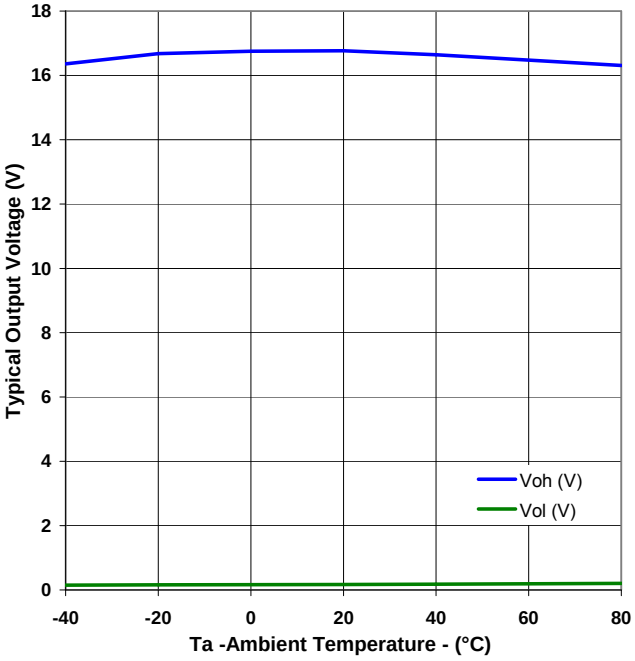


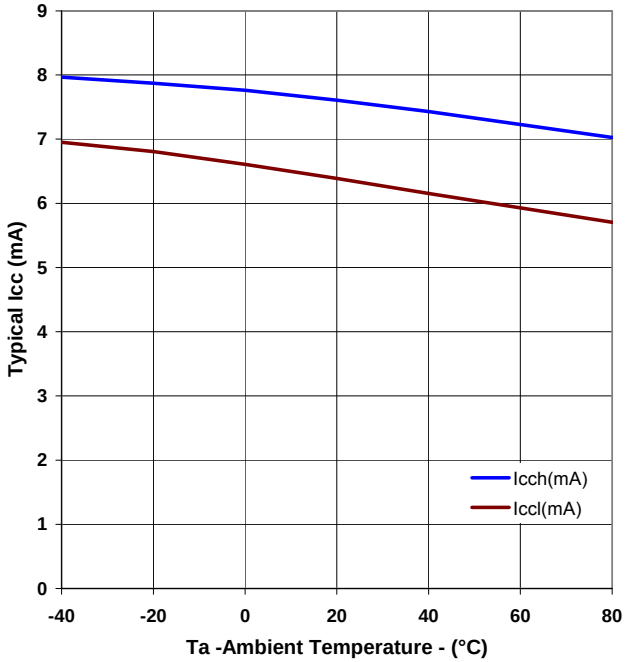

### Typical Trigger Current and Hysteresis Ratio vs Ambient Temperature




### Output Voltage vs Ambient Temperature




### Supply Current vs Ambient Temperature





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