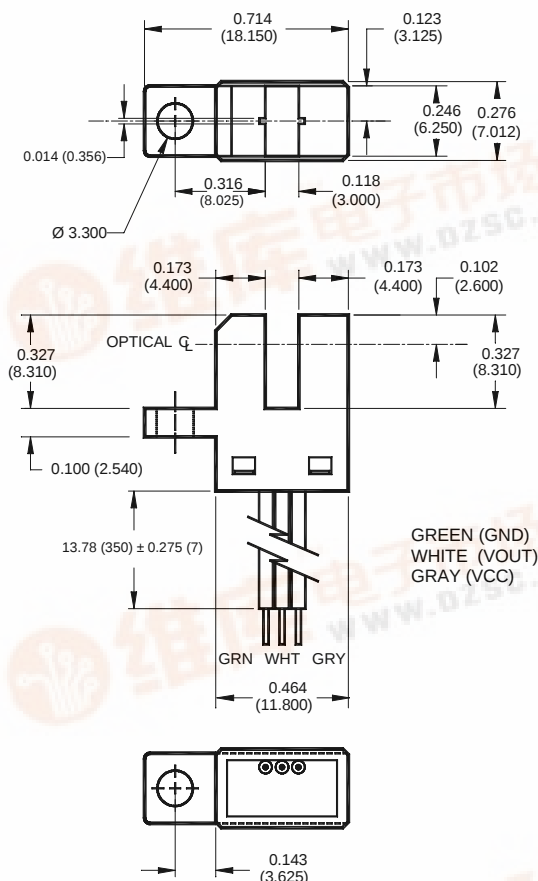


**FAIRCHILD**  
SEMICONDUCTOR™

**QVE00112**

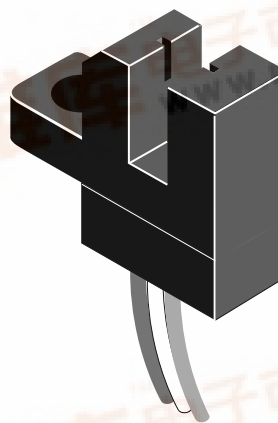
## OPTOLOGIC® OPTICAL INTERRUPTER SWITCH

### PACKAGE DIMENSIONS



#### NOTES:

1. Dimensions for all drawings are in inches (millimeters).
2. Tolerance of  $\pm .010$  (.25) on all non-nominal dimensions unless otherwise specified.
3. Wire gauge: 24 AWG, 7 strand, pre-tinned copper.



### FEATURES

- No contact switching
- Mounting tab
- Wire leads for remote connection
- 3 mm slot
- Output configuration: Inverter open-collector
- TTL/CMOS compatible output
- Aperture width: .014"

### NOTES (Applies to Max Ratings and Characteristics Tables.)

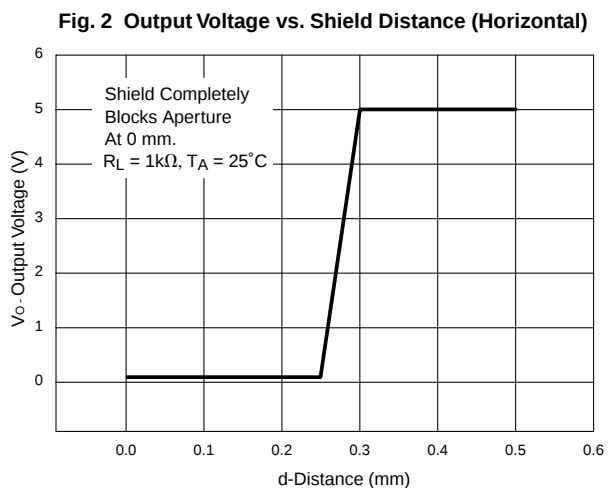
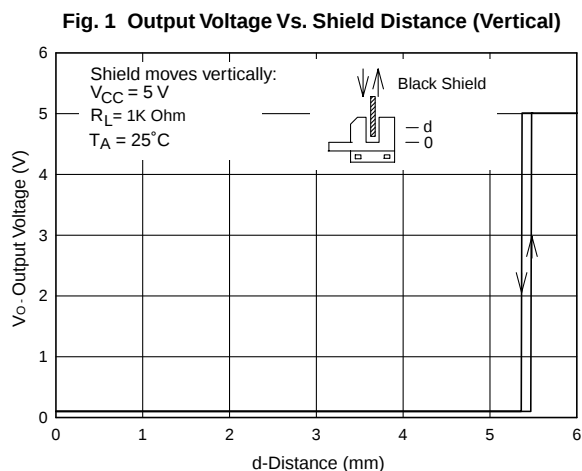
1. Derate power dissipation linearly 1.67 mW/°C above 25°C.
2. Derate power dissipation linearly 2.50 mW/°C above 25°C.
3. RMA flux is recommended.
4. Methanol or isopropyl alcohols are recommended as cleaning agents.

### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise specified)

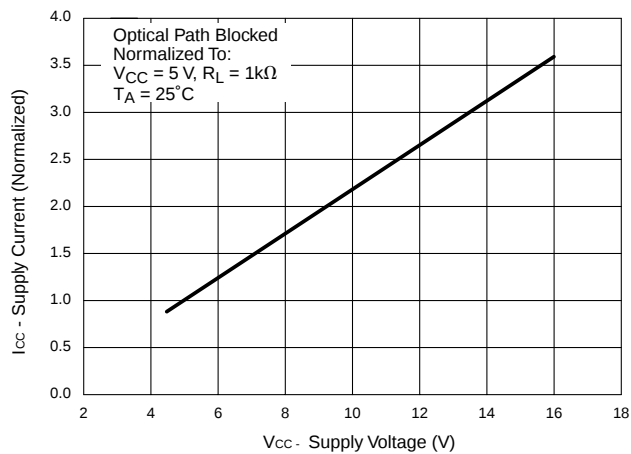
| Parameter                                     | Symbol      | Rating        | Units |
|-----------------------------------------------|-------------|---------------|-------|
| Operating Temperature                         | $T_{OPR}$   | -40 to +85    | °C    |
| Storage Temperature                           | $T_{STG}$   | -40 to +85    | °C    |
| Soldering Temperature (Iron) <sup>(3,4)</sup> | $T_{SOL-I}$ | 240 for 5 sec | °C    |
| <b>EMITTER</b>                                |             |               |       |
| Continuous Forward Current                    | $I_F$       | 50            | mA    |
| Reverse Voltage                               | $V_R$       | 5             | V     |
| Power Dissipation <sup>(1)</sup>              | $P_D$       | 100           | mW    |
| <b>SENSOR</b>                                 |             |               |       |
| Output Current                                | $I_O$       | 50            | mA    |
| Supply Voltage                                | $V_{CC}$    | 16            | V     |
| Output Voltage                                | $V_O$       | 30            | V     |
| Power Dissipation <sup>(2)</sup>              | $P_D$       | 150           | mW    |

### ELECTRICAL / OPTICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)

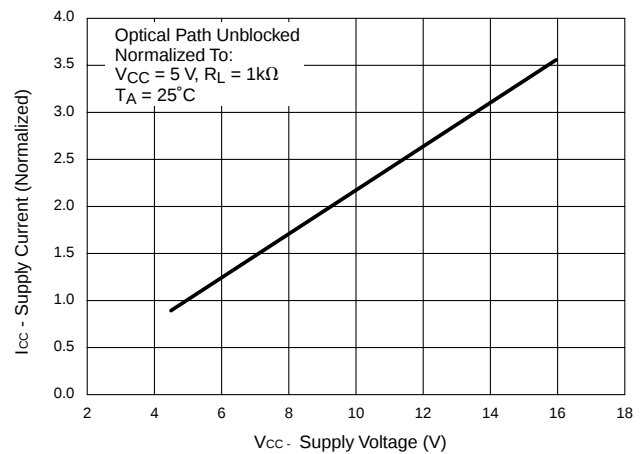
| PARAMETER                 | TEST CONDITIONS                                                    | SYMBOL                              | MIN. | TYP. | MAX. | UNITS |
|---------------------------|--------------------------------------------------------------------|-------------------------------------|------|------|------|-------|
| Operating Supply Voltage  |                                                                    | V <sub>CC</sub>                     | 4.5  | —    | 16   | V     |
| <b>INPUT DIODE</b>        |                                                                    |                                     |      |      |      |       |
| Forward Voltage           | I <sub>F</sub> = 20 mA                                             | V <sub>F</sub>                      | —    | —    | 1.7  | V     |
| Reverse Leakage Current   | V <sub>R</sub> = 5 V                                               | I <sub>R</sub>                      | —    | —    | 10   | μA    |
| <b>COUPLED</b>            |                                                                    |                                     |      |      |      |       |
| Operating Supply Current  | V <sub>CC</sub> = 16 V                                             | I <sub>CC</sub>                     | —    | —    | 12   | mA    |
| Low Level Output Voltage  | V <sub>CC</sub> = 5 V, R <sub>L</sub> = 360 Ω                      | V <sub>OL</sub>                     | —    | —    | 0.4  | V     |
| High Level Output Current | V <sub>CC</sub> = 5 V, V <sub>OH</sub> = 30 V (Light Path Blocked) | I <sub>OH</sub>                     | —    | —    | 100  | μA    |
| Hysteresis Ratio          |                                                                    |                                     | —    | 1.2  | —    |       |
| Propagation Delay         | V <sub>CC</sub> = 5 V, R <sub>L</sub> = 360 Ω                      | t <sub>PLH</sub> , t <sub>PHL</sub> | —    | 5    | —    | μs    |
| Output Rise and Fall Time | V <sub>CC</sub> = 5 V, R <sub>L</sub> = 360 Ω                      | t <sub>r</sub> , t <sub>f</sub>     | —    | 70   | —    | ns    |



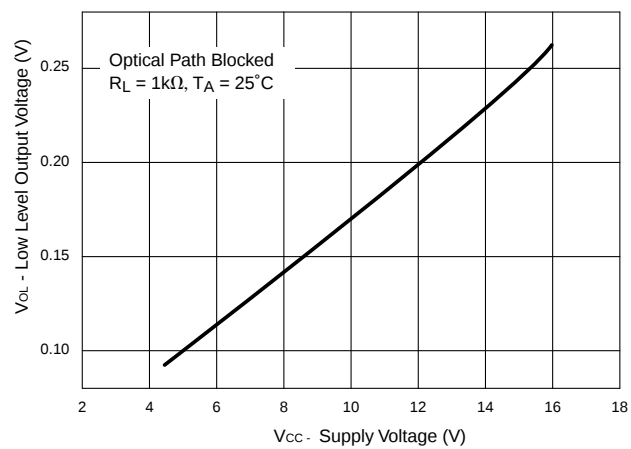
**Fig. 3 Supply Current vs. Supply Voltage**



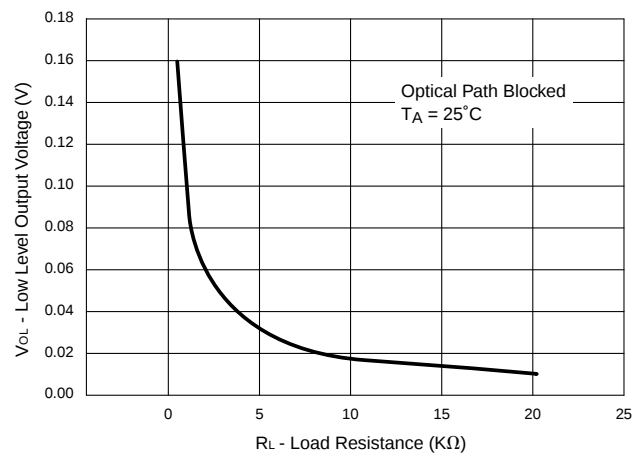
**Fig. 4 Supply Current vs. Supply Voltage**



**Fig. 5 Low Level Output Voltage vs. Supply Voltage**



**Fig. 6 Low Level Output Voltage vs. Load Resistance**



The schematic diagram shows a power supply circuit. It starts with a Vcc input (Gray Wire) connected to a Voltage Regulator. The Voltage Regulator's output is connected to a Load (LA) and a diode. The diode's output is connected to a MOSFET, which then drives the output Vout (White Wire) to GND (Green Wire). The circuit also includes a resistor and a diode in parallel with the Vcc input.

The diagram illustrates the timing characteristics of a digital circuit. It consists of two waveforms: an Input Signal and an Output Signal.

**Input Signal:** A square wave that transitions from 0 mA to a high level and back to 0 mA. The high level is labeled 50%.

**Output Signal:** A square wave that transitions from a high level ( $V_{OH}$ ) to a low level ( $V_{OL}$ ) and back to  $V_{OH}$ . The high level is labeled 10% and the low level is labeled 90%.

**Timing Parameters:**

- $t_{PHL}$ : Propagation delay from the input signal rising to the output signal falling.
- $t_{PLH}$ : Propagation delay from the input signal falling to the output signal rising.
- $t_f$ : Fall time of the output signal, measured from 50% to 90%.
- $t_r$ : Rise time of the output signal, measured from 90% to 10%.

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2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.