

# Slotted Optical Switch

## OPB830 and OPB840 (L and W)



### Features:

- 0.125" (3.18 mm) wide slot
- Choice of electrical output parameters
- Choice of aperture
- Choice of opaque or IR transmissive shell material
- Side mount configuration
- Choice of lead spacing (L Series)
- 24" [610 mm] 26 AWG wire leads (W Series)



### Description:

OPB830 and OPB840 series provide the design engineer with the flexibility of a custom device from a standard product line. The L Series offers a choice of PCBoard mount lead spacing, while the W Series offers 24" (610mm) 26AWG wire leads.

Building from a standard housing that utilizes a .375" (9.5 mm) wide slot, a user can specify the electrical output parameters, choice of aperture, discrete shell material, side mount configuration, and a choice of lead spacing (for the L Series) or 24" [610 mm] UL approved 26 AWG wire leads (W Series).

Housings are made from an opaque grade of injection-molded plastic that minimizes the assembly's sensitivity to visible and near-infrared ambient radiation. Discrete shells (exposed on the parallel faces inside the device throat) are made of either IR transmissive plastic (for applications where aperture contamination may occur) or of opaque plastic with aperture openings (for maximum protection against ambient light).

Switching of the phototransistor occurs whenever an opaque object passes through the slot and interrupts the beam.

### Applications:

- Non-contact interruptive object sensing
- Assembly line automation
- Machine automation
- Equipment security
- Machine safety

#### General Note

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### Electrical Specifications

#### Absolute Maximum Ratings ( $T_A=25^\circ\text{C}$ unless otherwise noted)

|  |                                      |
|--|--------------------------------------|
| Storage and Operating Temperature<br>L Series <sup>(1)</sup><br>W Series <sup>(1)</sup>                    | -40° C to +85° C<br>-40° C to +80° C |
| Lead Soldering Temperature [1/16 inch (1.6mm) from the case for 5 sec. with soldering iron] <sup>(2)</sup> | 260° C                               |

#### Input Diode

|   |        |
|---|--------|
| Forward DC Current  | 50 mA  |
| Peak Forward Current (1 $\mu\text{s}$ pulse width, 300 pps) | 1 A    |
| Reverse DC Voltage  | 2 V    |
| Power Dissipation <sup>(1)</sup>                            | 100 mW |

#### Output Phototransistor

|                                  |        |
|----------------------------------|--------|
| Collector-Emitter Voltage        | 30 V   |
| Emitter-Collector Voltage        | 5 V    |
| Collector DC Current             | 30 mA  |
| Power Dissipation <sup>(1)</sup> | 100 mW |

#### Electrical Characteristics ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

| SYMBOL | PARAMETER | MIN | TYP | MAX | UNITS | TEST CONDITIONS |
|--------|-----------|-----|-----|-----|-------|-----------------|
|--------|-----------|-----|-----|-----|-------|-----------------|

#### Input Diode LED (See OP240 for additional information—for reference only)

|       |                 |   |   |     |               |                      |
|-------|-----------------|---|---|-----|---------------|----------------------|
| $V_F$ | Forward Voltage | - | - | 1.7 | V             | $I_F = 20\text{ mA}$ |
| $I_R$ | Reverse Current | - | - | 100 | $\mu\text{A}$ | $V_R = 2\text{ V}$   |

#### Output Transistor (See OP550 for additional information—for reference only)

|               |                                     |    |   |     |    |                          |
|---------------|-------------------------------------|----|---|-----|----|--------------------------|
| $V_{(BR)CEO}$ | Collector-Emitter Breakdown Voltage | 30 | - | -   | V  | $I_C = 1\text{ mA}$      |
| $V_{(BR)ECO}$ | Emitter-Collector Breakdown Voltage | 5  | - | -   | V  | $I_E = 100\ \mu\text{A}$ |
| $I_{CEO}$     | Collector-Emitter Dark Current      | -  | - | 100 | nA | $V_{CE} = 10\text{ V}$   |

#### Notes:

- (1) Derate linearly 1.67 mW/° C above 25° C for L Series.
- (2) RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering.
- (3) Methanol or isopropanol are recommended as cleaning agents. Plastic housing is soluble in chlorinated hydrocarbons and ketones.
- (4) The W Series includes wire terminations of 24" (610 mm) 7-strand, 26 AWG UL insulated wire on each terminal. Each device incorporates a wire strain relief at the housing surface. The insulation functions and colors are: anode (red), cathode (black), phototransistor collector (white) and phototransistor emitter (green).
- (5) All parameters tested using pulse technique.

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### Electrical Characteristics (T<sub>A</sub> = 25°C unless otherwise noted)

| SYMBOL               | PARAMETER  | MIN   | TYP | MAX | UNITS | TEST CONDITIONS                                  |
|----------------------|--|-------|-----|-----|-------|--|
| <b>Combined</b>      |  |       |     |     |       |  |
| V <sub>CE(SAT)</sub> | Collector-Emitter Saturation Voltage<br>Parameter A (OPB830L,OPB840L)<br>(OPB835L, OPB845L)<br>(OPB830W,OPB840W)<br>(OPB835W, OPB845W) | -     | -   | 0.4 | V     | I <sub>C</sub> = 400 μA, I <sub>F</sub> = 20 mA  |
|                      | Parameter B (OPB831L,OPB841L)<br>(OPB836L,OPB846L)<br>(OPB831W,OPB841W)<br>(OPB836W,OPB846W)   | -     | -   | 0.4 | V     | I <sub>C</sub> = 800 μA, I <sub>F</sub> = 10 mA  |
|                      | Parameter C (OPB832L,OPB842L)<br>(OPB837L,OPB847L)<br>(OPB832W,OPB842W)<br>(OPB837W,OPB847W)   | -     | -   | 0.6 | V     | I <sub>C</sub> = 1800 μA, I <sub>F</sub> = 20 mA |
| I <sub>C(ON)</sub>   | On-State Collector Current<br>Parameter A (OPB830L,OPB840L)<br>(OPB835L, OPB845L)<br>(OPB830W,OPB840W)<br>(OPB835W, OPB845W)           | 0.625 | -   | -   | mA    | V <sub>CE</sub> = 10 V, I <sub>F</sub> = 20 mA   |
|                      | Parameter B (OPB831L,OPB841L)<br>(OPB836L,OPB846L)<br>(OPB831W,OPB841W)<br>(OPB836W,OPB846W)   | 1.250 | -   | -   | mA    | V <sub>CE</sub> = 5 V, I <sub>F</sub> = 10 mA    |
|                      | Parameter C (OPB832L,OPB842L)<br>(OPB837L,OPB847L)<br>(OPB832W,OPB842W)<br>(OPB837W,OPB847W)   | 2.250 | -   | -   | mA    | V <sub>CE</sub> = .6 V, I <sub>F</sub> = 20 mA   |

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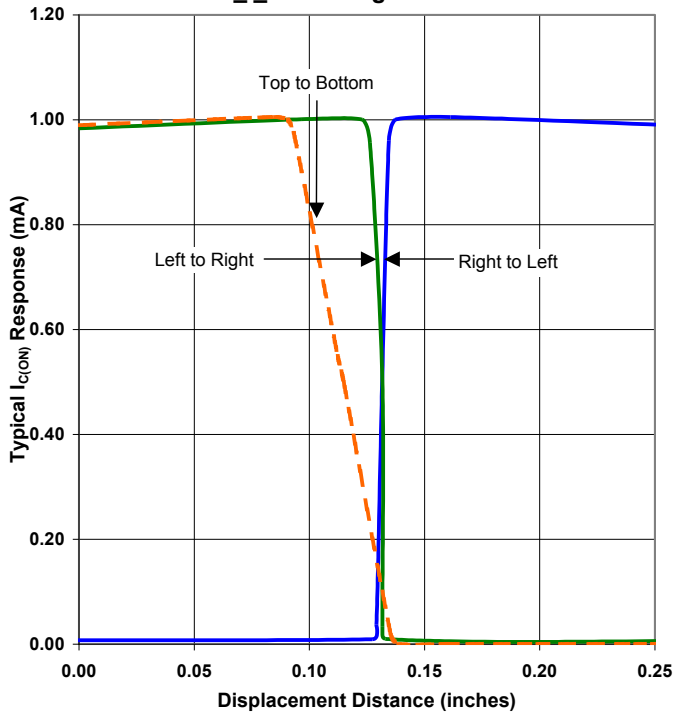
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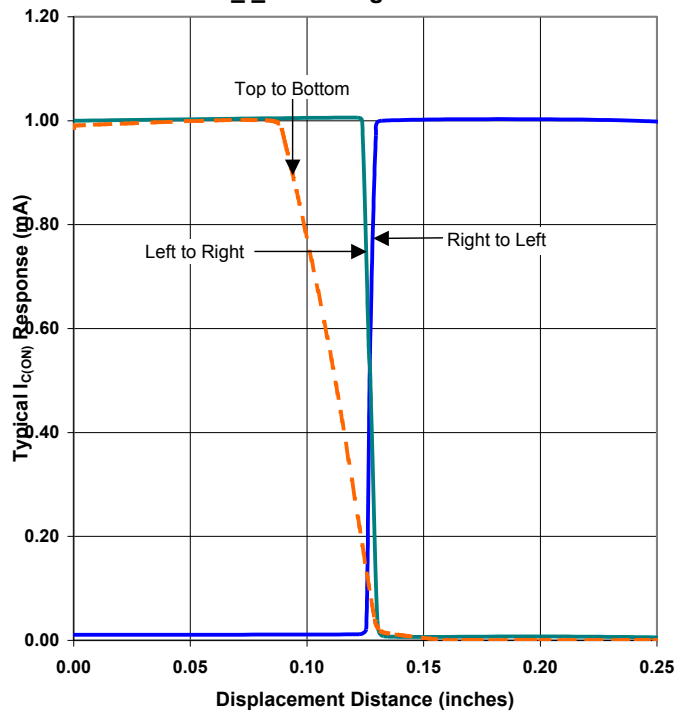
## OPB830 and OPB840 (L and W)



OPB8\_\_ L11 - Flag Next to Emitter



OPB8\_\_ L11 - Flag Next to Sensor



OPB8\_\_ L11 - Flag in Middle of Slot



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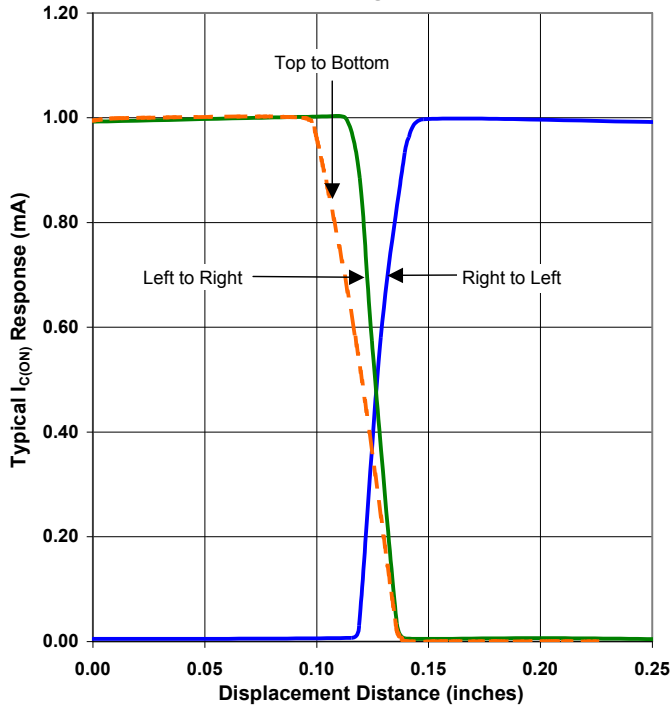
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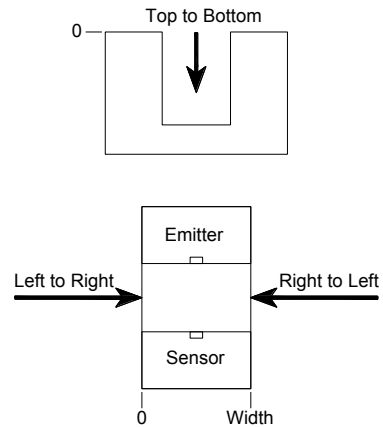
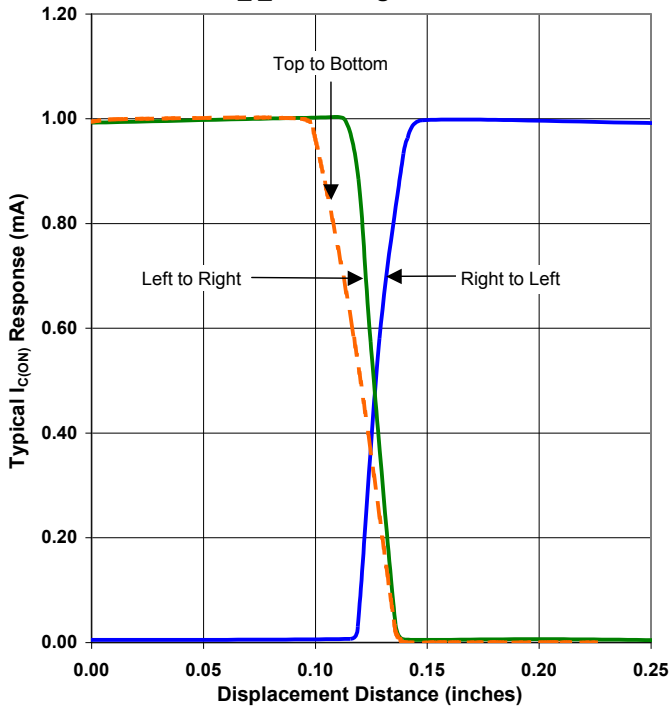
OPB8\_\_ L51 - Flag Next to Emitter



OPB8\_\_ L51 - Flag Next to Sensor



OPB8\_\_ L51 - Flag in Middle of Slot



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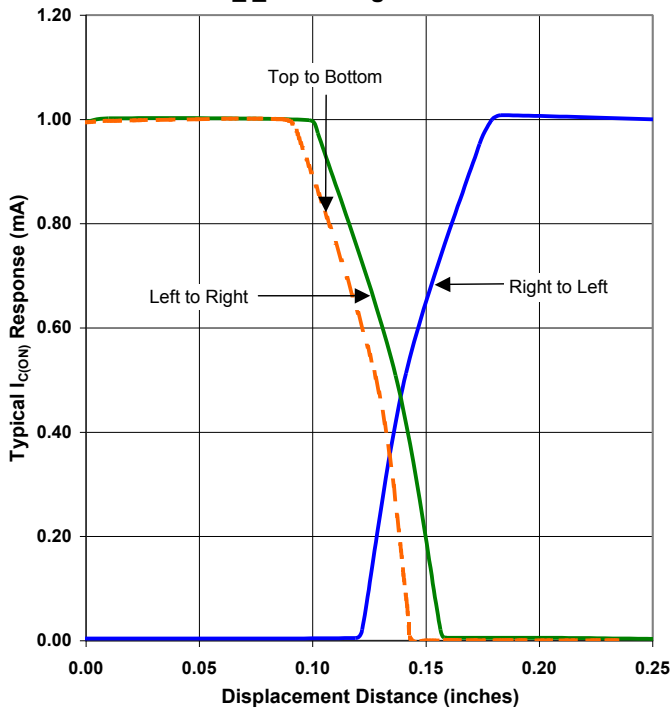
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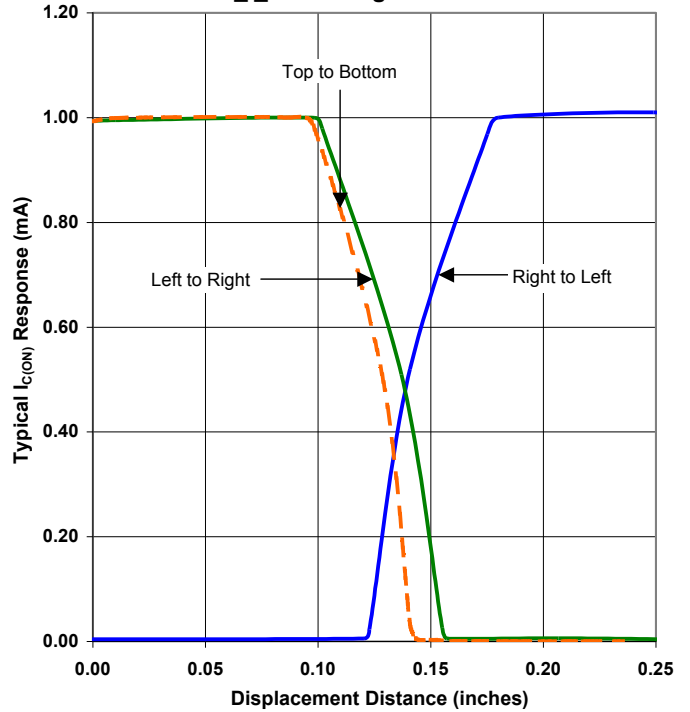
## OPB830 and OPB840 (L and W)



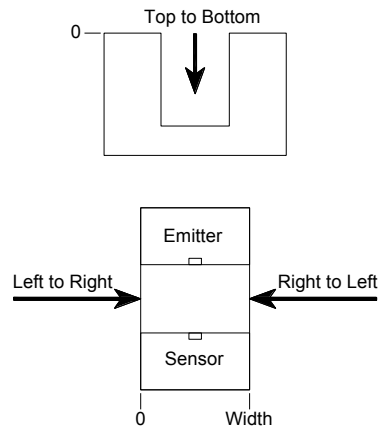
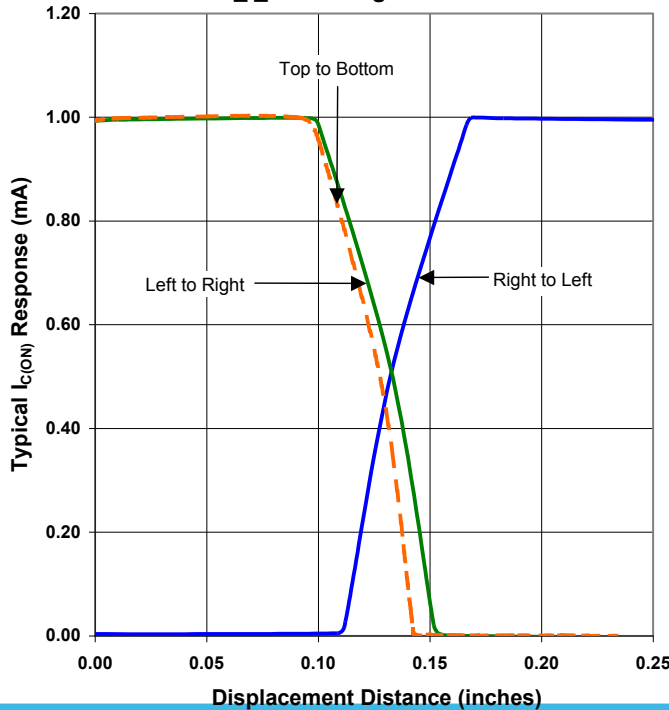
OPB8\_\_ L55 - Flag Next to Emitter



OPB8\_\_ L55 - Flag Next to Sensor



OPB8\_\_ L55 - Flag in Middle of Slot



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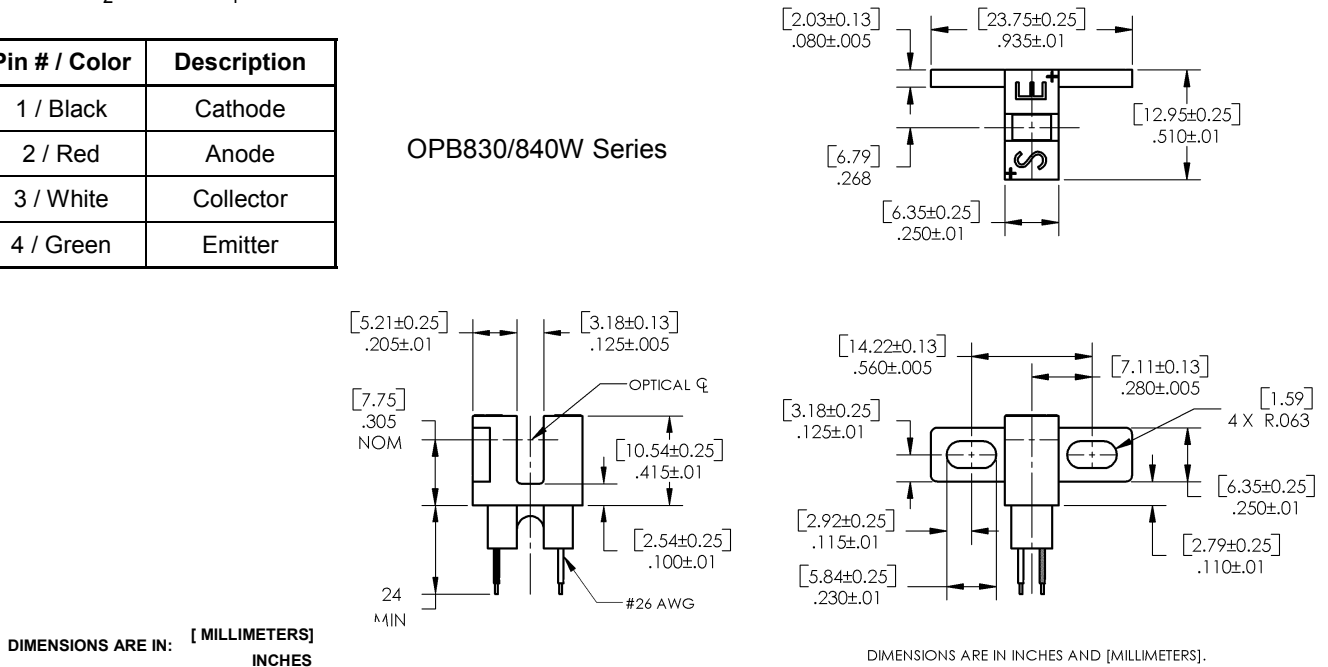
### Packaging

#### OPB830/840L Series



| Pin # / Color | Description |
|---------------|-------------|
| 1 / Black     | Cathode     |
| 2 / Red       | Anode       |
| 3 / White     | Collector   |
| 4 / Green     | Emitter     |

#### OPB830/840W Series



DIMENSIONS ARE IN: [ MILLIMETERS]  
INCHES

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### Part Number Guide — OPB8XX

OPB 8 X X L X X

Optek Assembly

Phototransistor Output Family

Discrete Shell Material:

- 3 — Side mount IR transmissive  
Plastic discrete shell
- 4 — Side mount opaque  
Plastic discrete shell

Sensor Aperture:

- 1 — 0.010" (0.25 mm)
- 5 — 0.050" (1.27 mm)

Emitter Aperture:

- 1 — 0.010" (0.25 mm)
- 5 — 0.050" (1.27 mm)

Mounting configurations:

- L — Solder lead termination

#### Electrical Specification Variations:

- 0 = Electrical Parameter A - (0.320" lead spacing)
- 1 = Electrical Parameter B - (0.320" lead spacing)
- 2 = Electrical Parameter C - (0.320" lead spacing)
- 5 = Electrical Parameter A - (0.220" lead spacing)
- 6 = Electrical Parameter B - (0.220" lead spacing)
- 7 = Electrical Parameter C - (0.220" lead spacing)

#### Notes:

- Assemblies with dual 0.010" apertures are currently available with electrical parameter "A" only.

### Part Number Guide — OPB8XX

OPB 8 X X W X X Z

Optek Assembly

Phototransistor Output Family

Discrete Shell Material:

- 3 — Side mount IR transmissive  
Plastic discrete shell
- 4 — Side mount opaque  
Plastic discrete shell

Sensor Aperture:

- 1 — 0.010" (0.25 mm)
- 5 — 0.050" (1.27 mm)

Emitter Aperture:

- 1 — 0.010" (0.25 mm)
- 5 — 0.050" (1.27 mm)

Mounting configurations:

- W — Wire termination
  - Parts ending with "Z" meet RoHS requirements
  - Wires = 26 AWG—24" Long

#### Electrical Specification Variations:

- 0 = Electrical Parameter A
- 1 = Electrical Parameter B
- 2 = Electrical Parameter C

#### Notes:

- Assemblies with dual 0.010" apertures are currently available with electrical parameter "A" only.

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