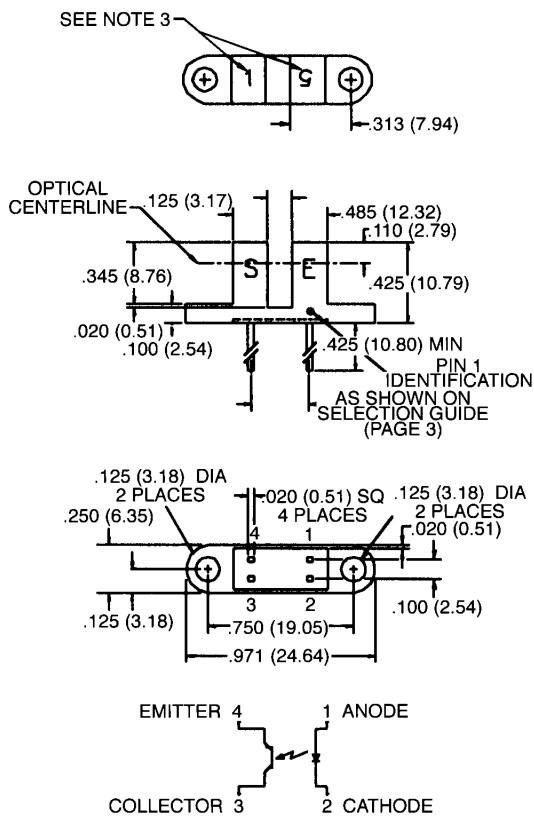




## SLOTTED OPTICAL SWITCH

### QVB SERIES

#### PACKAGE DIMENSIONS



#### DESCRIPTION

The QVB series of switches is designed to allow the user maximum flexibility in applications. Each switch consists of an infrared emitting diode facing an NPN photo-transistor across a .125" (3.18 mm) gap. A unique housing design provides a smooth external surface to prevent dust and dirt buildup while molded internal apertures give precise positioning and also provide protection from ambient light interference.

#### FEATURES

- Ambient light and dust protection.
- Lead spacing available at .220", .300", or .320".
- .050" and .010" apertures available.

ST2175

#### NOTES:

1. DIMENSIONS ARE IN INCHES (mm).
2. TOLERANCE IS  $\pm .010$  (.25) UNLESS OTHERWISE SPECIFIED.
3. NUMBER INDICATES APERTURE SIZE. (5 = .050", 1 = .010")



## SLOTTED OPTICAL SWITCH

### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ Unless Otherwise Specified)

|                         |                                     |
|-------------------------|-------------------------------------|
| Storage Temperature     | -40°C to + 85°C                     |
| Operating Temperature   | -40°C to + 85°C                     |
| Soldering:              |                                     |
| Lead Temperature (Iron) | 240°C for 5 sec. <sup>(2,3,4)</sup> |
| Lead Temperature (Flow) | 260°C for 10 sec. <sup>(2,3)</sup>  |

#### INPUT DIODE

|                            |                       |
|----------------------------|-----------------------|
| Continuous Forward Current | 50 mA                 |
| Reverse Voltage            | 5.0 Volts             |
| Power Dissipation          | 100 mW <sup>(1)</sup> |

#### OUTPUT TRANSISTOR

|                           |                       |
|---------------------------|-----------------------|
| Collector-Emitter Voltage | 30 Volts              |
| Emitter-Collector Voltage | 5.0 Volts             |
| Collector Current         | 40 mA                 |
| Power Dissipation         | 100 mW <sup>(1)</sup> |

### ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ Unless Otherwise Specified)

| PARAMETER                   | SYMBOL        | MIN.                        | TYP. | MAX. | UNITS         | TEST CONDITIONS                             |
|-----------------------------|---------------|-----------------------------|------|------|---------------|---------------------------------------------|
| <b>INPUT DIODE</b>          |               |                             |      |      |               |                                             |
| Forward voltage             | $V_F$         | —                           |      | 1.70 | V             | $I_F = 20 \text{ mA}$                       |
| Reverse Leakage Current     | $I_R$         | —                           |      | 100  | $\mu\text{A}$ | $V_R = 2.0 \text{ V}$                       |
| <b>OUTPUT TRANSISTOR</b>    |               |                             |      |      |               |                                             |
| Emitter-Collector Breakdown | $BV_{ECO}$    | 5                           |      | —    | V             | $I_E = 100 \mu\text{A}, E_e = 0$            |
| Collector-Emitter Breakdown | $BV_{CEO}$    | 30                          |      | —    | V             | $I_C = 1.0 \text{ mA}, E_e = 0$             |
| Collector-Emitter Leakage   | $I_{CEO}$     | —                           |      | 100  | nA            | $V_{CE} = 10.0 \text{ V}, E_e = 0$          |
| <b>COUPLED</b>              |               |                             |      |      |               |                                             |
| On-State Collector Current  | $I_{C(ON)}$   | See selection guide page 3. |      |      | mA            | $I_F = 20 \text{ mA}, V_{CE} = 5 \text{ V}$ |
| Saturation Voltage          | $V_{CE(SAT)}$ | —                           |      | 0.40 | V             | $I_F = 20 \text{ mA}, I_C = 0.1 \text{ mA}$ |

### NOTES

- Derate power dissipation linearly 1.67 mW/°C above 25°C.
- RMA flux is recommended.
- Methanol or Isopropanol alcohols are recommended as cleaning agents.
- Soldering iron tip 1/16" (1.6 mm) from housing.



## SLOTTED OPTICAL SWITCH

| <b>QVBXXX OPTICAL SWITCH SELECTION GUIDE</b> |              |           |        |             |     |  |
|----------------------------------------------|--------------|-----------|--------|-------------|-----|--|
| PART NUMBER                                  | LEAD SPACING | APERTURES |        | $I_{C(ON)}$ |     |  |
|                                              |              | LED       | SENSOR | MIN         | MAX |  |
| QVB11123                                     | .220"        | 0.050"    | 0.010" | 0.20        | —   |  |
| QVB11124                                     | .220"        | 0.050"    | 0.010" | 0.50        | —   |  |
| QVB11223                                     | .300"        | 0.050"    | 0.010" | 0.20        | —   |  |
| QVB11224                                     | .300"        | 0.050"    | 0.010" | 0.50        | —   |  |
| QVB11323                                     | .320"        | 0.050"    | 0.010" | 0.20        | —   |  |
| QVB11324                                     | .320"        | 0.050"    | 0.010" | 0.50        | —   |  |
| QVB11133                                     | .220"        | 0.050"    | 0.050" | 0.50        | —   |  |
| QVB11134                                     | .220"        | 0.050"    | 0.050" | 1.00        | —   |  |
| QVB11233                                     | .300"        | 0.050"    | 0.050" | 0.50        | —   |  |
| QVB11234                                     | .300"        | 0.050"    | 0.050" | 1.00        | —   |  |
| QVB11333                                     | .320"        | 0.050"    | 0.050" | 0.50        | —   |  |
| QVB11334                                     | .320"        | 0.050"    | 0.050" | 1.00        | —   |  |
| QVB21113                                     | .220"        | 0.010"    | 0.010" | 0.10        | —   |  |
| QVB21114                                     | .220"        | 0.010"    | 0.010" | 0.20        | —   |  |
| QVB21213                                     | .300"        | 0.010"    | 0.010" | 0.10        | —   |  |
| QVB21214                                     | .300"        | 0.010"    | 0.010" | 0.20        | —   |  |
| QVB21313                                     | .320"        | 0.010"    | 0.010" | 0.10        | —   |  |
| QVB21314                                     | .320"        | 0.010"    | 0.010" | 0.20        | —   |  |