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# QSB363 / QSB363GR / QSB363YR / QSB363ZR

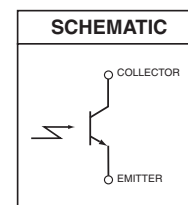
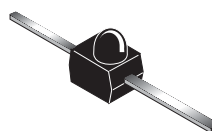
## Subminiature Plastic Silicon Infrared Phototransistor

### Features

- NPN Silicon Phototransistor
- T-3/4 (2 mm) Surface Mount Package
- Medium Wide Beam Angle: 24°
- Black Plastic Package
- Matched Emitters: QEB363 or QEB373
- Daylight Filter
- Tape & Reel Option (see Tape & Reel Specifications)
- Lead Form Options: Gull-wing, Yoke, Z-Bend

### Description

The QSB363 is a silicon phototransistor encapsulated in a black infrared transparent T-3/4 package.



### Ordering Information

| Part Number | Operating Temperature | Package         | Packing Method |
|-------------|-----------------------|-----------------|----------------|
| QSB363      | -40 to +85°C          | T-3/4           | Bulk           |
| QSB363GR    |                       | T-3/4 Gull-wing | Tape and Reel  |
| QSB363YR    |                       | T-3/4 Yoke      | Tape and Reel  |
| QSB363ZR    |                       | T-3/4 Z-Bend    | Tape and Reel  |

## Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at  $T_A = 25^\circ\text{C}$  unless otherwise specified.

| Symbol             | Parameter                                     | Min.       | Unit             |
|--------------------|-----------------------------------------------|------------|------------------|
| $T_{\text{OPR}}$   | Operating Temperature                         | -40 to +85 | $^\circ\text{C}$ |
| $T_{\text{STG}}$   | Storage Temperature                           | -40 to +85 |                  |
| $T_{\text{SOL-I}}$ | Soldering Temperature (Iron) <sup>(1,2)</sup> | 260        |                  |
| $T_{\text{SOL-F}}$ | Soldering Temperature (Flow) <sup>(1,2)</sup> | 260        |                  |
| $V_{\text{CEO}}$   | Collector Emitter Voltage                     | 30         |                  |
| $V_{\text{ECO}}$   | Emitter Collector Voltage                     | 5          | V                |
| $P_C$              | Power Dissipation <sup>(3)</sup>              | 75         | mW               |

### Notes:

1. RMA flux is recommended.
2. Methanol or isopropyl alcohols are recommended as cleaning agents.
3. Derate power dissipation linearly 1.08 mW/ $^\circ\text{C}$  above  $25^\circ\text{C}$ .

## Electrical / Optical Characteristics

Values are at  $T_A = 25^\circ\text{C}$  unless specified otherwise.

| Symbol               | Parameter                            | Test Conditions                                                                                | Min. | Typ.     | Max. | Units         |
|----------------------|--------------------------------------|------------------------------------------------------------------------------------------------|------|----------|------|---------------|
| $\lambda_p$          | Peak Sensitivity Wavelength          |                                                                                                |      | 940      |      | nm            |
| $\Theta$             | Reception Angle                      |                                                                                                |      | $\pm 12$ |      | $^\circ$      |
| $I_{\text{CEO}}$     | Collector Dark Current               | $V_{\text{CE}} = 20\text{ V}$ ,<br>$E_e = 0\text{ mW/cm}^2$                                    |      |          | 100  | nA            |
| $BV_{\text{CEO}}$    | Collector-Emitter Breakdown Voltage  | $I_C = 100\text{ }\mu\text{A}$ ,<br>$E_e = 0\text{ mW/cm}^2$                                   | 30   |          |      | V             |
| $BV_{\text{ECO}}$    | Emitter-Collector Breakdown Voltage  | $I_E = 100\text{ }\mu\text{A}$ ,<br>$E_e = 0\text{ mW/cm}^2$                                   | 5    |          |      | V             |
| $I_{\text{C(ON)}}$   | On-State Collector Current           | $V_{\text{CE}} = 5\text{ V}$ ,<br>$E_e = 1\text{ mW/cm}^2$ ,<br>$\lambda = 940\text{ nm GaAs}$ | 1.0  | 1.5      |      | mA            |
| $V_{\text{CE(SAT)}}$ | Collector-Emitter Saturation Voltage | $I_C = 2\text{ mA}$ ,<br>$E_e = 1\text{ mW/cm}^2$ ,<br>$\lambda = 940\text{ nm GaAs}$          |      |          | 0.4  | V             |
| $t_r$                | Rise Time                            | $V_{\text{CE}} = 5\text{ V}$ , $I_C = 1\text{ mA}$ ,<br>$R_L = 1000\text{ }\Omega$             |      | 15       |      | $\mu\text{s}$ |
| $t_f$                | Fall Time                            |                                                                                                |      | 15       |      | $\mu\text{s}$ |

## Typical Performance Characteristics

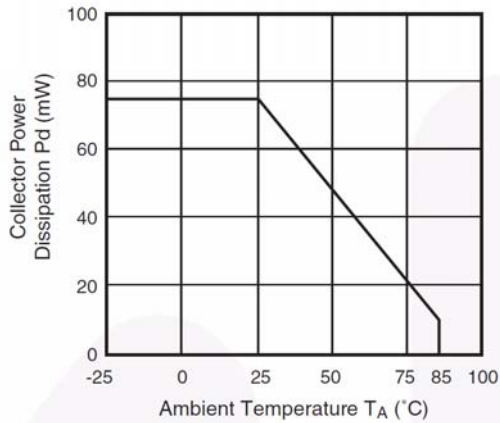


Figure 1. Collector Power Dissipation vs. Ambient Temperature

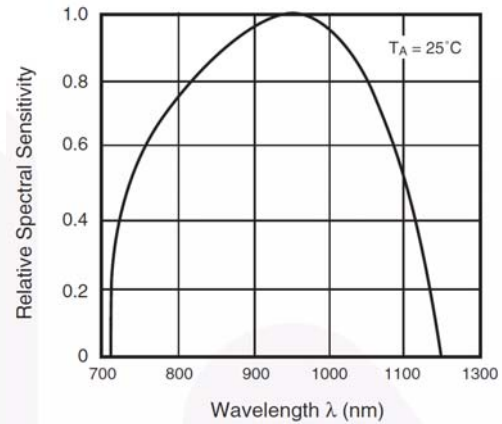


Figure 2. Spectral Sensitivity

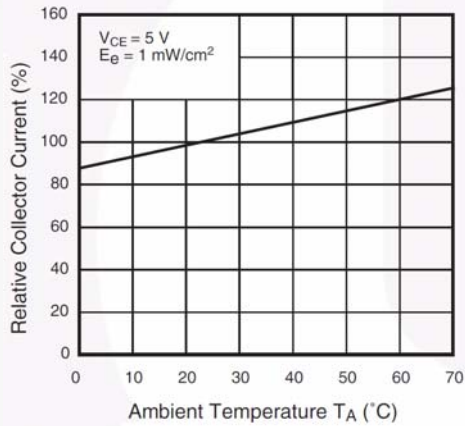


Figure 3. Relative Collector Current vs. Ambient Temperature

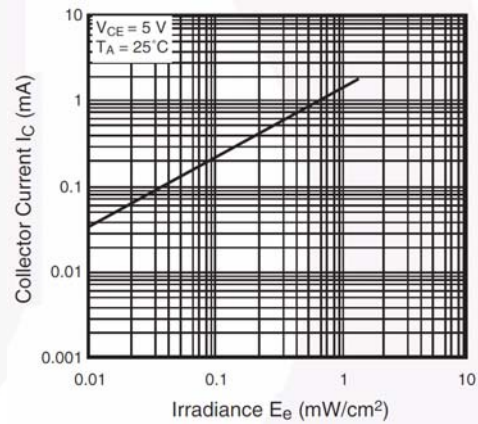


Figure 4. Collector Current vs. Irradiance

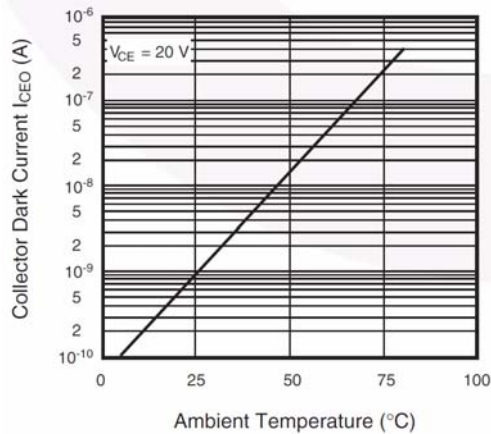


Figure 5. Collector Dark Current vs. Ambient Temperature

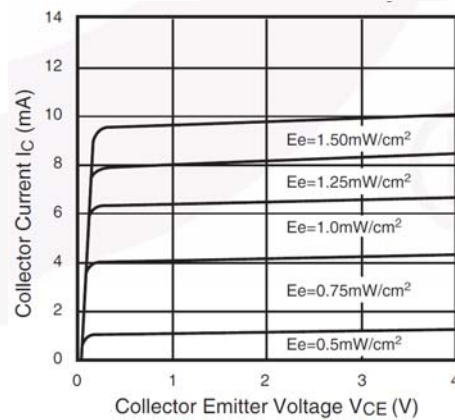
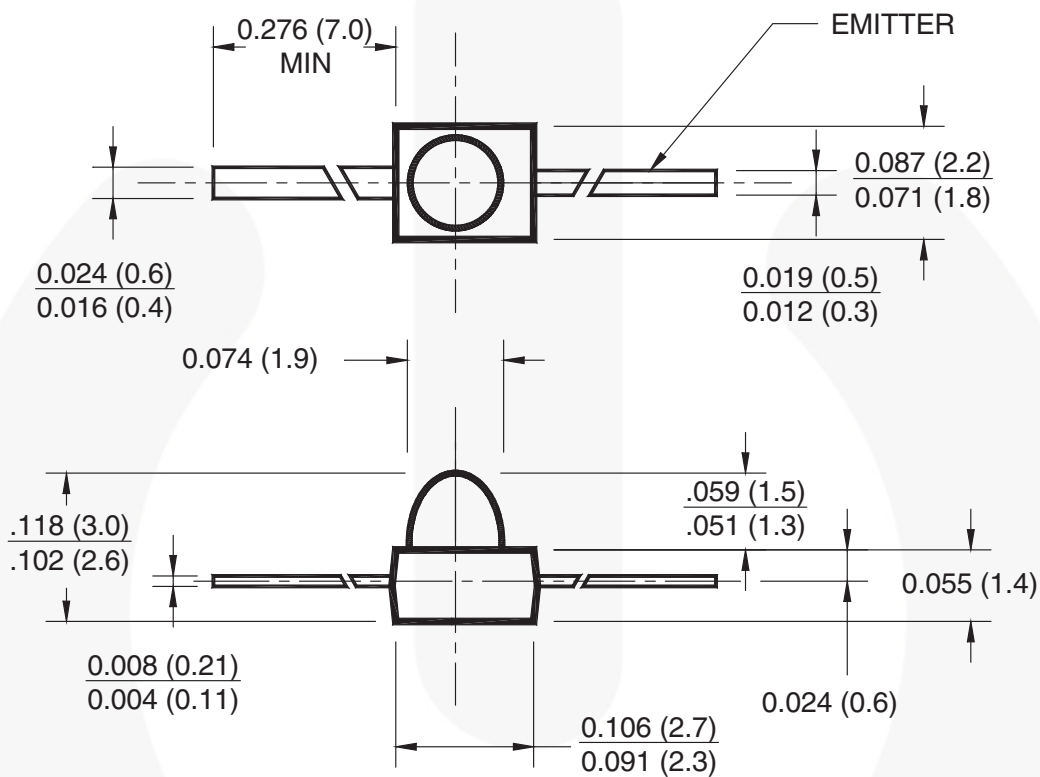


Figure 6. Collector Current vs. Collector Emitter Voltage

## Physical Dimensions

### T-3/4



#### Notes:

1. Dimensions for all drawings are in inches (mm).
2. Tolerance of  $\pm 0.010$  (0.25) on all non-nominal dimensions unless otherwise specified.

**Figure 7. T-3/4, 2 MM DETECTOR (ACTIVE)**

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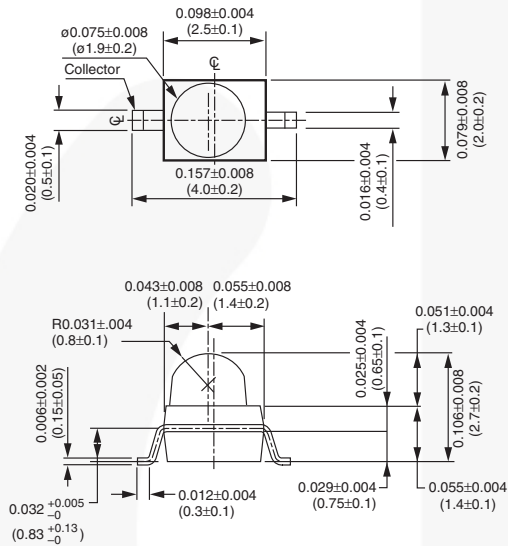
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## Physical Dimensions (continued)

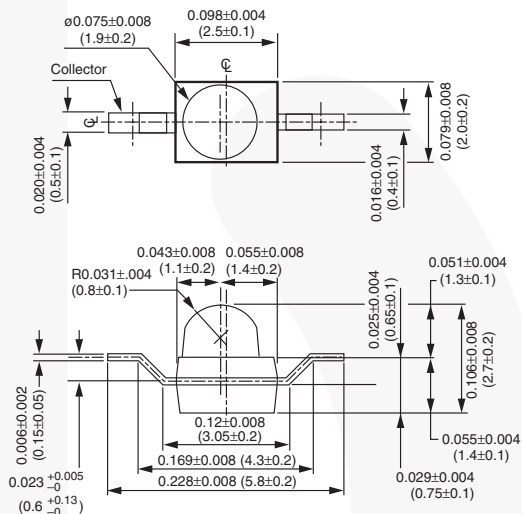
### Features

- Three lead forming options: Gull-wing, Yoke and Z-Bend
- Compatible with automatic placement equipment
- Supplied on tape and reel or in bulk packaging
- Compatible with vapor phase reflow solder processes

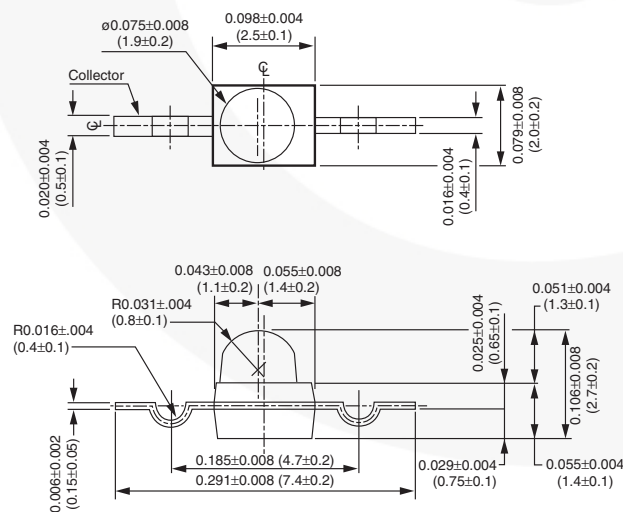
### Gull-wing Lead Configuration



### Z-Bend Lead Configuration



### Yoke Lead Configuration





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