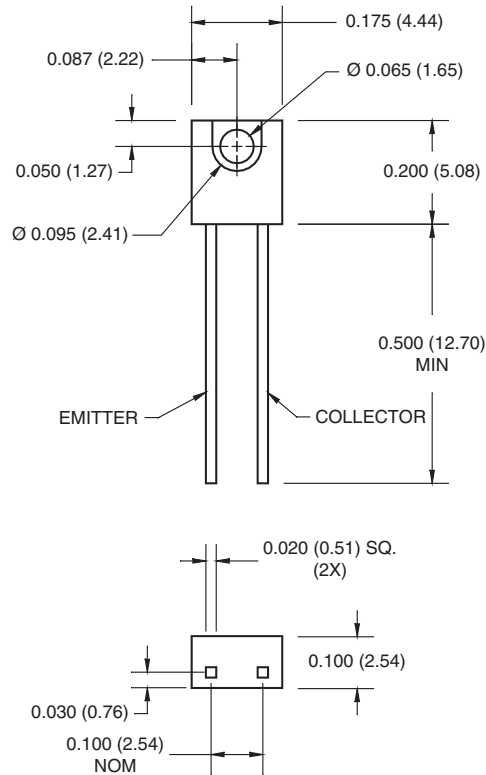
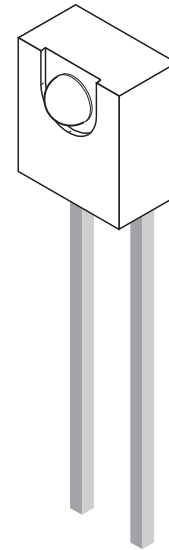


**PACKAGE DIMENSIONS**

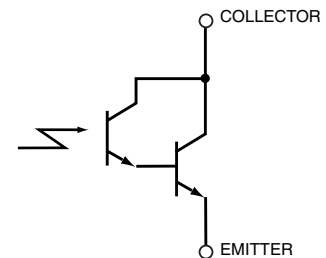


**NOTES:**

1. Dimensions for all drawings are in inches (mm).
2. Tolerance of  $\pm .010$  (.25) on all non-nominal dimensions unless otherwise specified.



**SCHEMATIC**



**DESCRIPTION**

The QSE133 is a silicon photodarlington encapsulated in a wide angle, infrared transparent, black plastic sidelooker package.

**FEATURES**

- NPN silicon phototransistor
- Package type: Sidelooker
- Medium wide reception angle, 50°
- Package material and color: black epoxy
- Matched emitter: QEE113
- Daylight filter
- High sensitivity

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

| Parameter                                       | Symbol      | Rating         | Unit             |
|---|-------------|----------------|------------------|
| Operating Temperature                           | $T_{OPR}$   | -40 to +100    | $^\circ\text{C}$ |
| Storage Temperature                             | $T_{STG}$   | -40 to +100    | $^\circ\text{C}$ |
| Soldering Temperature (Iron) <sup>(2,3,4)</sup> | $T_{SOL-I}$ | 240 for 5 sec  | $^\circ\text{C}$ |
| Soldering Temperature (Flow) <sup>(2,3)</sup>   | $T_{SOL-F}$ | 260 for 10 sec | $^\circ\text{C}$ |
| Collector Emitter Voltage                       | $V_{CE}$    | 30             | V                |
| Emitter Collector Voltage                       | $V_{EC}$    | 5              | V                |
| Power Dissipation <sup>(1)</sup>                | $P_D$       | 100            | mW               |

**NOTES:**

1. Derate power dissipation linearly 1.33 mW/ $^\circ\text{C}$  above 25 $^\circ\text{C}$ .
2. RMA flux is recommended.
3. Methanol or isopropyl alcohols are recommended as cleaning agents.
4. Soldering iron 1/16" (1.6 mm) minimum from housing.
5.  $\lambda = 880 \text{ nm}$  (AlGaAs).

**ELECTRICAL / OPTICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise specified)

| Parameter                                 | Test Conditions                                    | Symbol         | Min | Typ      | Max | Units         |
|---|--|----------------|-----|----------|-----|---------------|
| Peak Sensitivity                          |  | $\lambda_{PS}$ | —   | 880      | —   | nM            |
| Reception Angle                           |  | $\Theta$       | —   | $\pm 25$ | —   | Deg.          |
| Collector Emitter Dark Current            | $V_{CE} = 10 \text{ V}, E_e = 0$                   | $I_{CEO}$      | —   | —        | 100 | nA            |
| Collector-Emitter Breakdown               | $I_C = 1 \text{ mA}$                               | $BV_{CEO}$     | 30  | —        | —   | V             |
| Emitter-Collector Breakdown               | $I_E = 100 \mu\text{A}$                            | $BV_{ECO}$     | 5   | —        | —   | V             |
| On-State Collector Current <sup>(5)</sup> | $E_e = 0.25 \text{ mW/cm}^2, V_{CE} = 5 \text{ V}$ | $I_{C(ON)}$    | 9.0 | —        | —   | mA            |
| Saturation Voltage <sup>(5)</sup>         | $E_e = 0.5 \text{ mW/cm}^2, I_C = 0.4 \text{ mA}$  | $V_{CE(SAT)}$  | —   | —        | 1.0 | V             |
| Rise Time                                 | $I_C = 0.15 \text{ mA}, V_{CC} = 5 \text{ V},$     | $t_r$          | —   | 20       | —   | $\mu\text{s}$ |
| Fall Time                                 | $R_L = 100\Omega$                                  | $t_f$          | —   | 50       | —   | $\mu\text{s}$ |

Figure 1. Light Current vs. Radiant Intensity

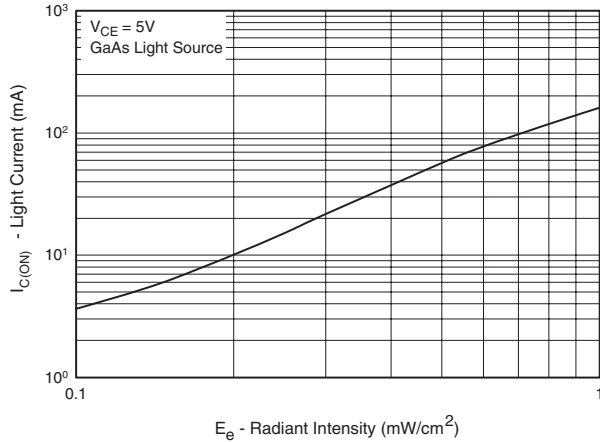


Figure 2. Angular Response Curve

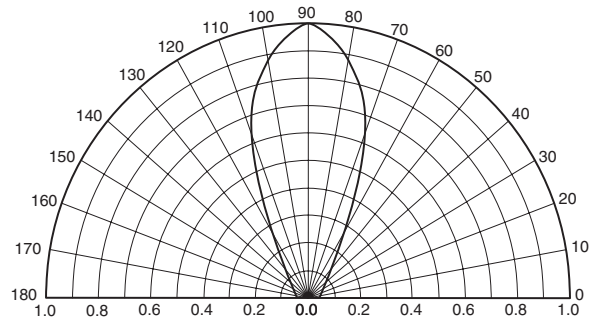


Figure 3. Dark Current vs. Collector - Emitter Voltage

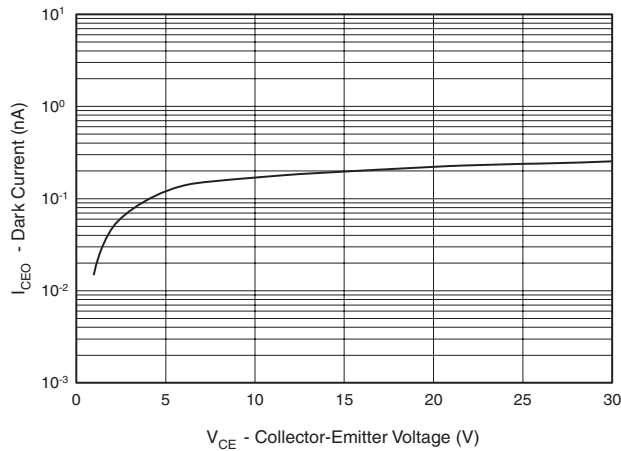


Figure 4. Light Current vs. Collector - Emitter Voltage

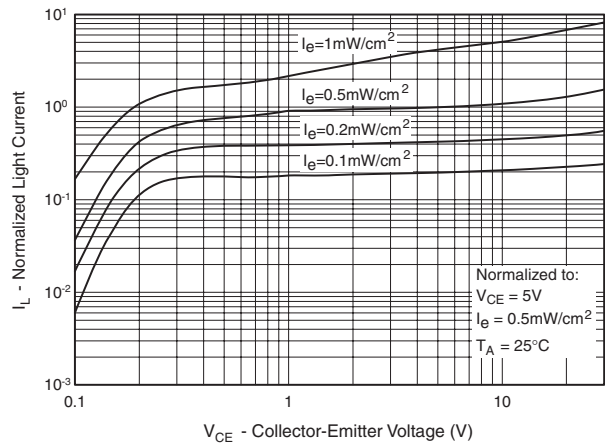
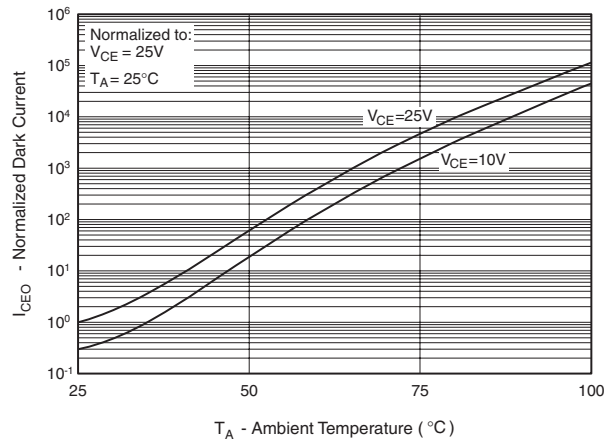


Figure 5. Dark Current vs. Ambient Temperature



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