

# Plastic Silicon Infrared Phototransistor

## QSE133

### Description

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

### Features

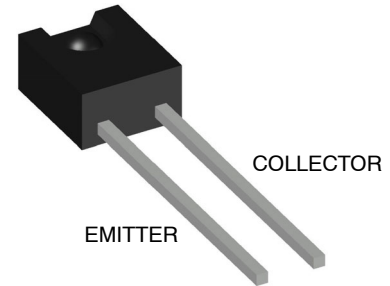
- NPN Silicon Phototransistor
- Package Type: Sidelooker
- Medium Wide Reception Angle, 50°
- Package Material and Color: Black Epoxy
- Matched Emitter: QEE113
- Daylight Filter
- High Sensitivity
- Yellow Dot Marking on the Top Side
- This is a Pb-Free Device

### ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25°C unless otherwise noted)

| Symbol             | Parameter                                       | Value        | Unit |
|--------------------|-------------------------------------------------|--------------|------|
| T <sub>OPR</sub>   | Operating Temperature                           | -40 to +100  | °C   |
| T <sub>STG</sub>   | Storage Temperature                             | -40 to +100  | °C   |
| T <sub>SOL-I</sub> | Soldering Temperature (Iron)<br>(Notes 2, 3, 4) | 240 for 5 s  | °C   |
| T <sub>SOL-F</sub> | Soldering Temperature (Flow)<br>(Notes 2, 3)    | 260 for 10 s | °C   |
| V <sub>CE</sub>    | Collector Emitter Voltage                       | 30           | V    |
| V <sub>EC</sub>    | Emitter Collector Voltage                       | 5            | V    |
| P <sub>D</sub>     | Power Dissipation (Note 1)                      | 100          | mW   |

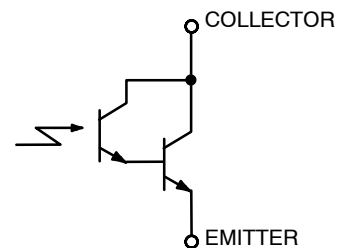
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. Derate power dissipation linearly 1.33 mW/°C above 25°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.



SIDELOOKER DETECTOR  
CASE 100CJ

### SCHEMATIC



### ORDERING INFORMATION

| Device | Package                          | Shipping            |
|--------|----------------------------------|---------------------|
| QSE133 | SIDELOOKER DETECTOR<br>(Pb-Free) | 500 Units /<br>Bulk |

## QSE133

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

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

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

5.  $\lambda = 880\text{ nm}$  (AlGaAs).

## TYPICAL PERFORMANCE CHARACTERISTICS

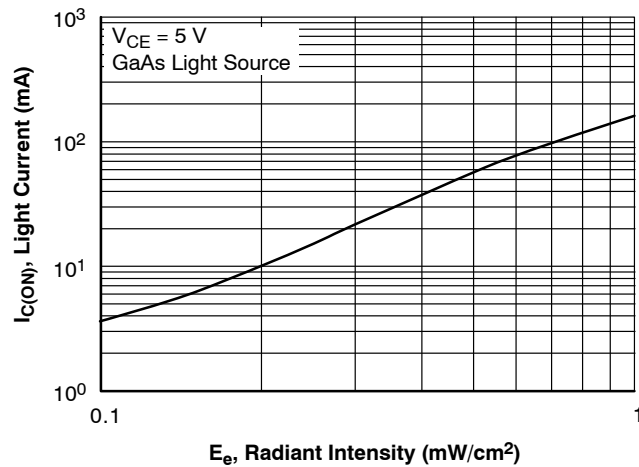


Figure 1. Light Current vs. Radiant Intensity

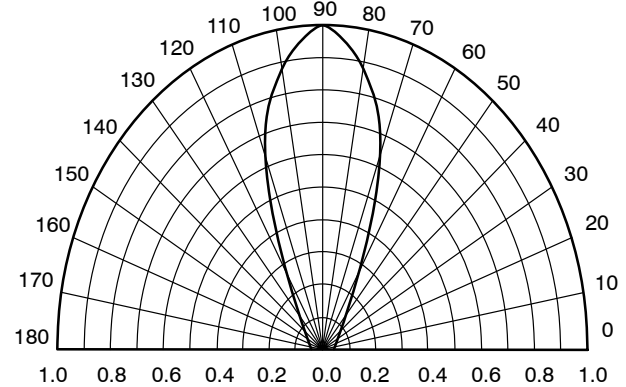


Figure 2. Angular Response Curve

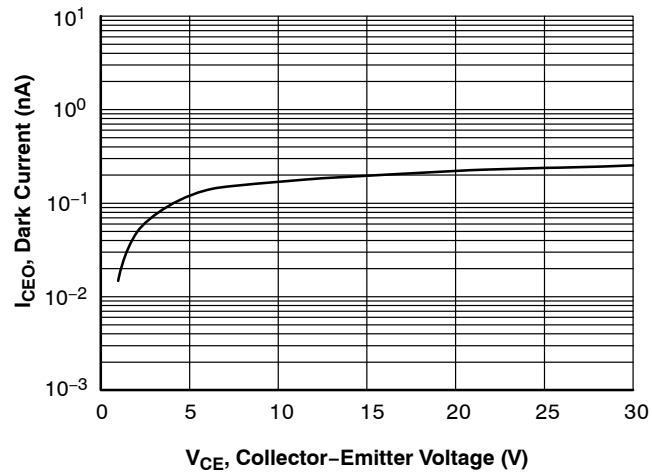


Figure 3. Dark Current vs. Collector - Emitter Voltage

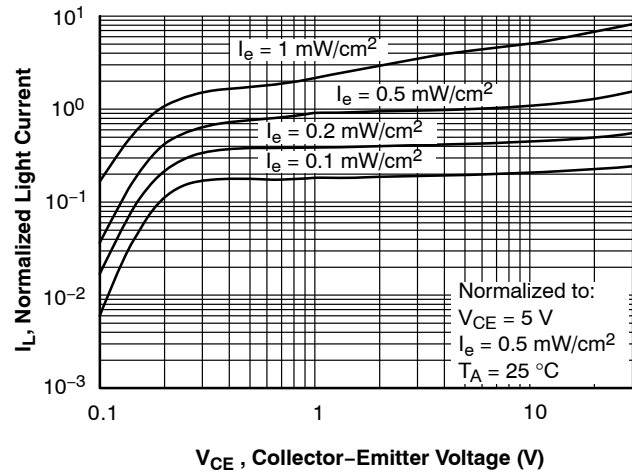


Figure 4. Light Current vs. Collector - Emitter Voltage

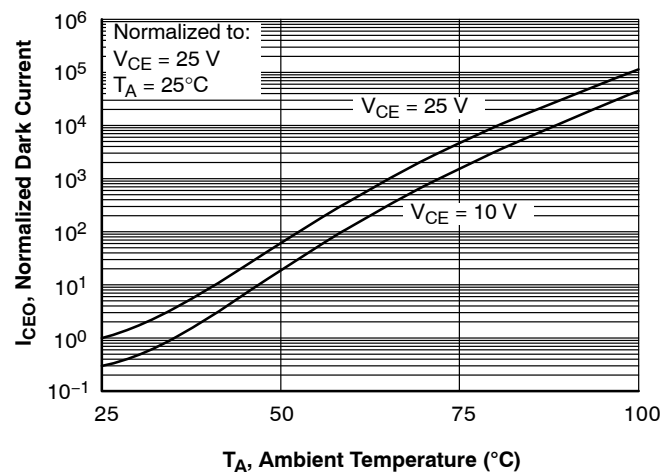
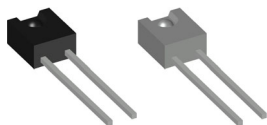
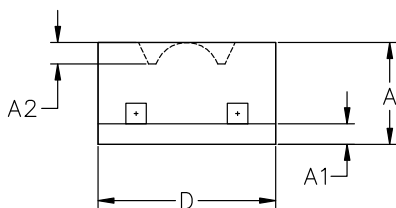


Figure 5. Dark Current vs. Ambient Temperature

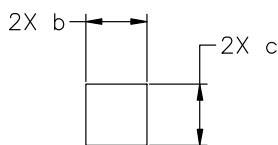


**SIDELOOKER 4.44x5.08x2.54, 2.54P**  
CASE 100CJ  
ISSUE A

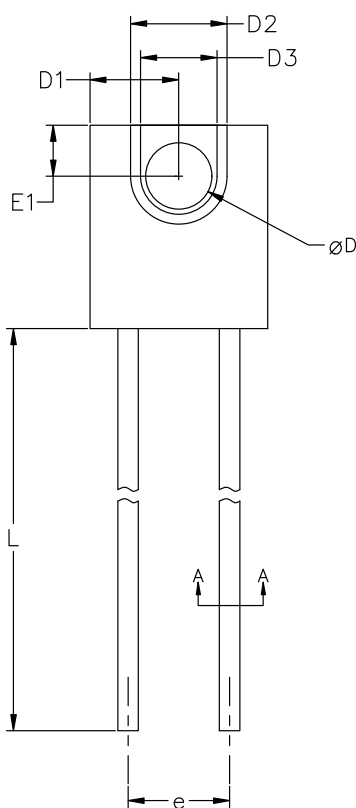
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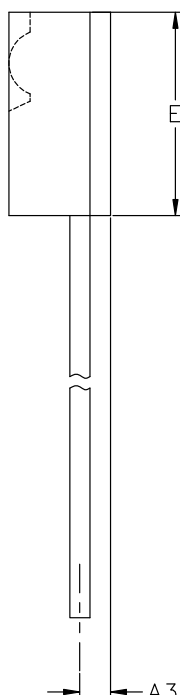
END VIEW



Section "A-A"  
Scale 3:1



TOP VIEW



SIDE VIEW

| DIMENSION (MILLIMETERS) |       |       |      |
|-------------------------|-------|-------|------|
|                         | MIN   | NOM   | MAX  |
| A                       | 2.41  | 2.54  | 2.67 |
| A1                      | 0.38  | 0.51  | 0.64 |
| A2                      | 0.48  | 0.53  | 0.58 |
| A3                      | 0.64  | 0.76  | 0.89 |
| b                       | 0.51  | 0.57  | 0.61 |
| c                       | 0.51  | 0.57  | 0.61 |
| D                       | 4.32  | 4.44  | 4.57 |
| D1                      | 2.16  | 2.21  | 2.29 |
| D2                      | 2.29  | 2.41  | 2.54 |
| D3                      | 1.78  | 1.91  | 2.03 |
| E                       | 4.83  | 5.08  | 5.33 |
| E1                      | 1.14  | 1.27  | 1.40 |
| e                       | 2.41  | 2.54  | 2.67 |
| øD                      | 1.52  | 1.65  | 1.78 |
| L                       | 12.70 | 13.46 | ---  |

NOTES:

1. DIMENSIONING AND TOLERANCING AS PER ASMEY14.5M, 2018.
2. CONTROLLING DIMENSION: MILLIMETERS.

|                         |                                         |                                                                                                                                                                                     |
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| <b>DESCRIPTION:</b>     | <b>SIDELOOKER 4.44x5.08x2.54, 2.54P</b> | <b>PAGE 1 OF 1</b>                                                                                                                                                                  |

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