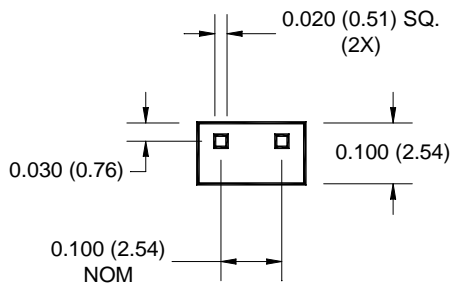
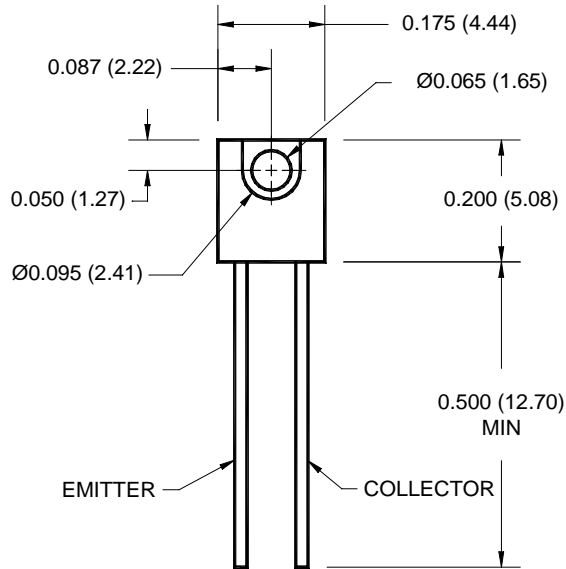
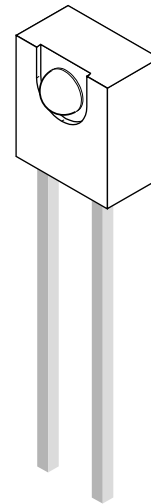


**PACKAGE DIMENSIONS**

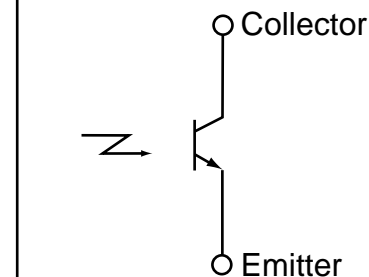


**NOTES:**

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 QSE113/114 is a silicon phototransistor 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

**QSE113 QSE114**

**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               |

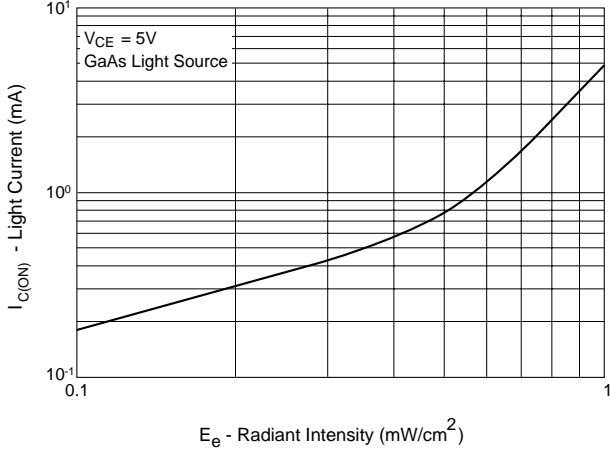
**NOTE:**

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" (1.6mm) minimum from housing.
5.  $\lambda = 880 \text{ nm}$  (AlGaAs).

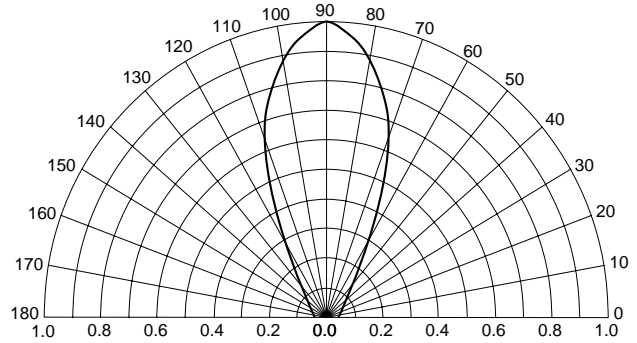
**ELECTRICAL / OPTICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise specified)

| 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><br>QSE113 | $E_e = 0.5 \text{ mW/cm}^2, V_{CE} = 5 \text{ V}$           | $I_{C(ON)}$    | 0.25 | —        | 1.50 | mA            |
| On-State Collector Current <sup>(5)</sup><br>QSE114 | $E_e = 0.5 \text{ mW/cm}^2, V_{CE} = 5 \text{ V}$           | $I_{C(ON)}$    | 1.00 | —        | —    | mA            |
| Saturation Voltage <sup>(5)</sup>                   | $E_e = 0.5 \text{ mW/cm}^2, I_C = 0.1 \text{ mA}$           | $V_{CE(SAT)}$  | —    | —        | 0.4  | V             |
| Rise Time   | $I_C = 1 \text{ mA}, V_{CC} = 5 \text{ V}, R_L = 100\Omega$ | $t_r$          | —    | 8        | —    | $\mu\text{s}$ |
| Fall Time   |   | $t_f$          | —    | 8        | —    | $\mu\text{s}$ |

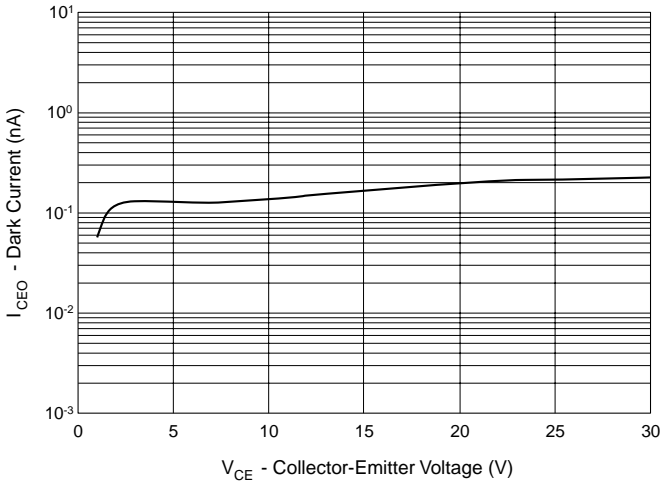
**Figure 1. Light Current vs. Radiant Intensity**



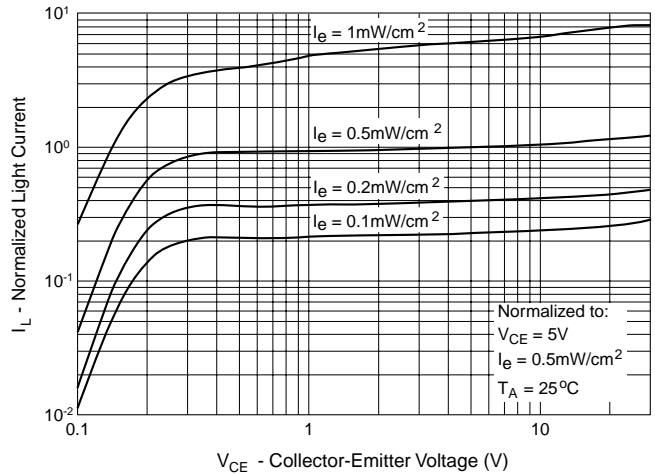
**Figure 2. Angular Response Curve**



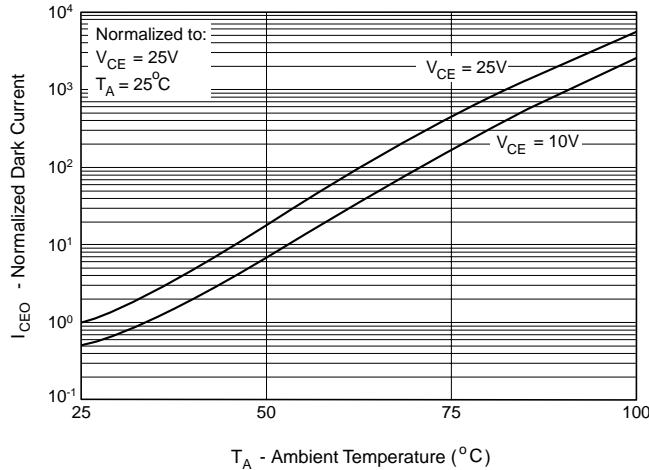
**Figure 3. Dark Current vs. Collector - Emitter Voltage**



**Figure 4. Light Current vs. Collector - Emitter Voltage**



**Figure 5. Dark Current vs. Ambient Temperature**



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