

# QSE213/QSE214 Plastic Silicon Infrared Phototransistor

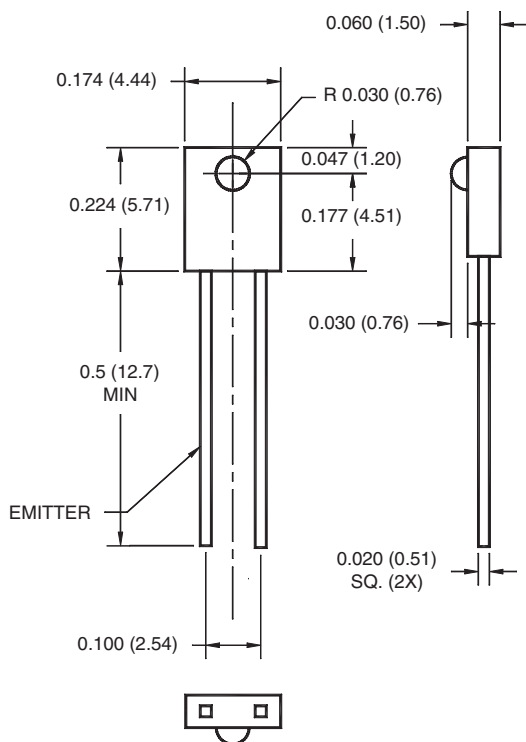
## Features

- NPN Silicon Phototransistor
- Package Type: Sidelooker
- Medium Reception Angle, 50°
- Daylight Filter
- Black Epoxy Package
- Matching Emitter: QEE213

## Description

The QSE213/QSE214 is a silicon phototransistor encapsulated in a medium angle, infrared transparent, black thin plastic side-looker package.

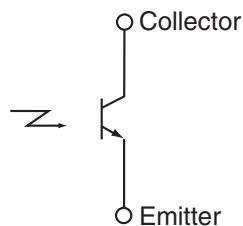
## Package Dimensions



### NOTES:

1. Dimensions for all drawings are in inches (mm).
2. Tolerance of  $\pm 0.10 \times 25$  on all non-nominal dimensions unless otherwise specified.

## Schematic



**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               |

**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                |                                                                                  | $Q$            | —    | $\pm 25$ | —    | Deg.          |
| Collector Emitter Dark Current | $V_{CE} = 10\text{ V}, E_e = 0$                                                  | $I_D$          | —    | —        | 100  | nA            |
| Collector Emitter Breakdown    | $I_C = 1\text{ mA}$                                                              | $BV_{CEO}$     | 30   | —        | —    | V             |
| Emitter Collector Breakdown    | $I_E = 100\text{ }\mu\text{A}$                                                   | $BV_{ECO}$     | 5    | —        | —    | V             |
| On-State Collector Current     | $E_e = 0.5\text{ mW/cm}^2, V_{CE} = 5\text{ V}$                                  | $I_{C(ON)}$    | 0.2  | —        | 1.50 | mA            |
|                                |                                                                                  |                | 1.00 | —        | —    |               |
| Saturation Voltage             | $V_{CE} = 5\text{ V}^{(5)}, E_e = 0.5\text{ mW/cm}^2, I_C = 0.1\text{ mA}^{(5)}$ | $V_{CE(SAT)}$  | —    | —        | 0.4  | V             |
| Rise Time                      | $V_{CC} = 5\text{ V}, R_L = 100\Omega, I_C = 1\text{ mA}$                        | $t_r$          | —    | 8        | —    | $\mu\text{s}$ |
| Fall Time                      |                                                                                  | $t_f$          | —    | 8        | —    |               |

**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.  $\lambda = 950\text{ nm}$  GaAs.

## Typical Performance Curves

Fig. 1 Dark Current vs. Collector Emitter Voltage

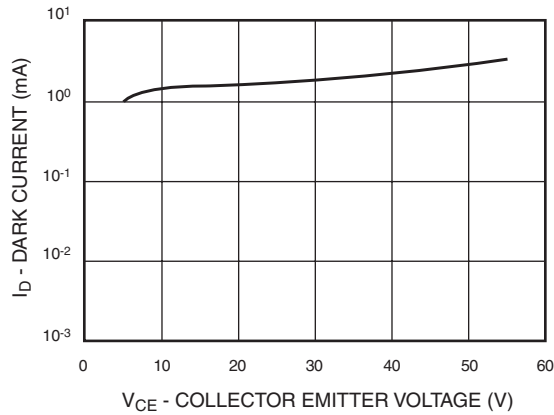


Fig. 2 Radiation Diagram

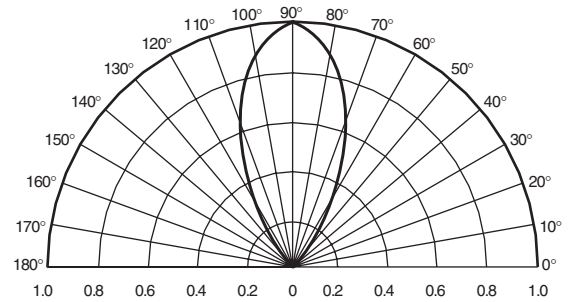


Fig. 3 Light Current vs. Ambient Temperature

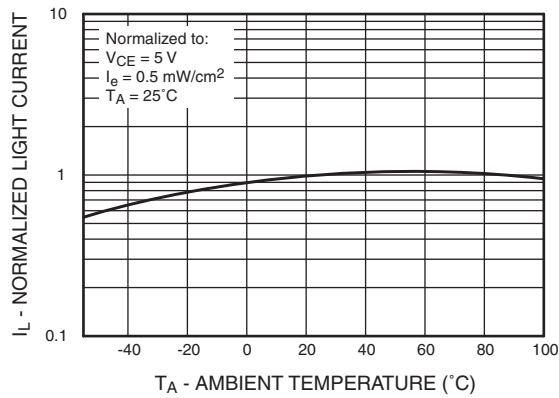


Fig. 4 Light Current vs. Collector to Emitter Voltage

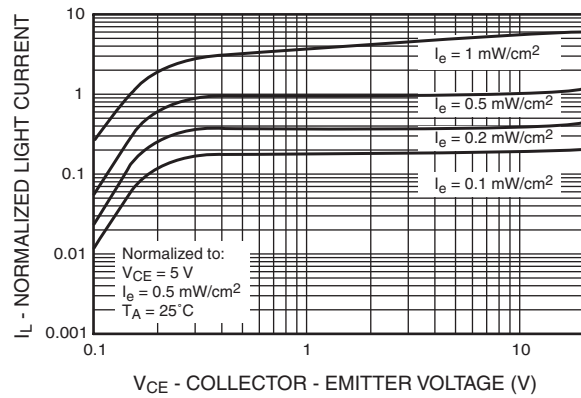
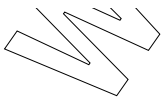
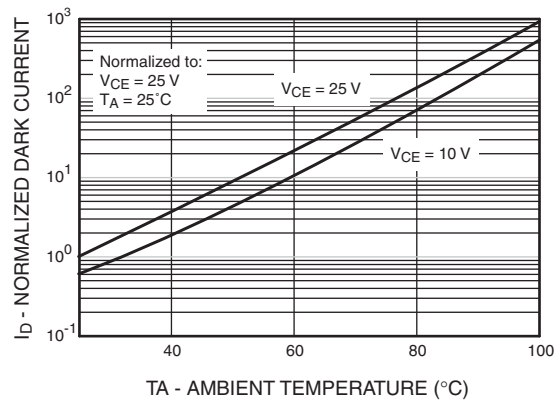


Fig. 5 Dark Current vs. Ambient Temperature



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