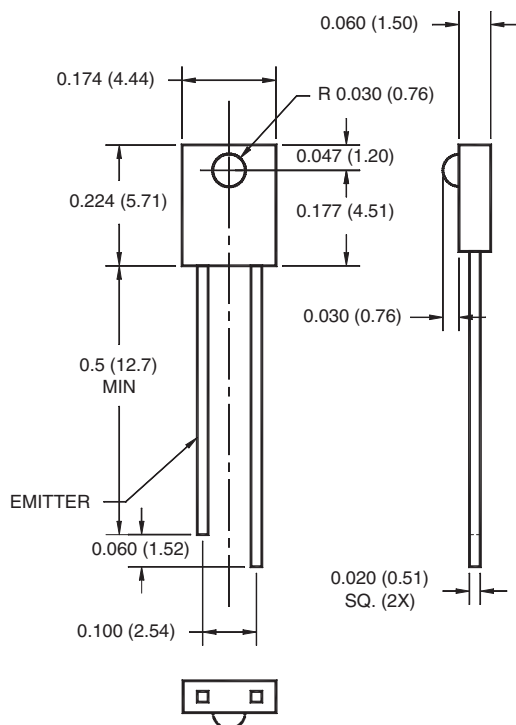


**QSE213**

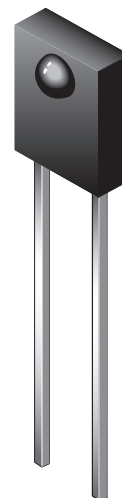
**QSE214**

**PACKAGE DIMENSIONS**

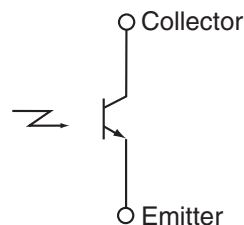


**NOTES:**

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

**FEATURES**

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

**QSE213**

**QSE214**

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

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

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

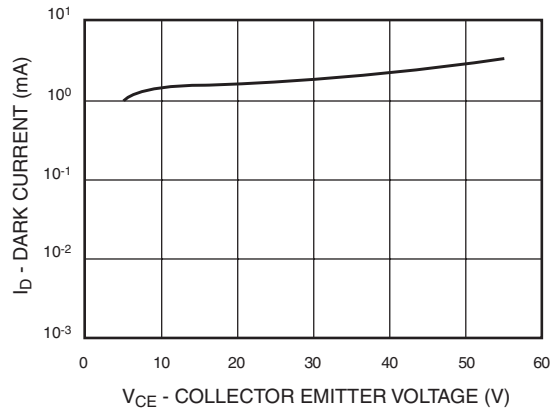
| Parameter                      | Test Conditions                                                                                      | Symbol                | Min  | Typ      | Max  | Units         |
|--------------------------------|------------------------------------------------------------------------------------------------------|-----------------------|------|----------|------|---------------|
| Peak Sensitivity               |                                                                                                      | $\lambda_{\text{PS}}$ | —    | 880      | —    | nM            |
| Reception Angle                |                                                                                                      | $\Theta$              | —    | $\pm 25$ | —    | Deg.          |
| Collector Emitter Dark Current | $V_{\text{CE}} = 10 \text{ V}$ , $E_e = 0$                                                           | $I_D$                 | —    | —        | 100  | nA            |
| Collector Emitter Breakdown    | $I_C = 1 \text{ mA}$                                                                                 | $BV_{\text{CEO}}$     | 30   | —        | —    | V             |
| Emitter Collector Breakdown    | $I_E = 100 \mu\text{A}$                                                                              | $BV_{\text{ECO}}$     | 5    | —        | —    | V             |
| On-State Collector Current     | $E_e = 0.5 \text{ mW/cm}^2$ , $V_{\text{CE}} = 5 \text{ V}$                                          | $I_{\text{C(ON)}}$    | 0.2  | —        | 1.50 | mA            |
|                                |                                                                                                      |                       | 1.00 | —        | —    |               |
| Saturation Voltage             | $V_{\text{CE}} = 5 \text{ V}^{(5)}$<br>$E_e = 0.5 \text{ mW/cm}^2$ ,<br>$I_C = 0.1 \text{ mA}^{(5)}$ | $V_{\text{CE(SAT)}}$  | —    | —        | 0.4  | V             |
| Rise Time                      | $V_{\text{CC}} = 5 \text{ V}$ , $R_L = 100\Omega$ , $I_C = 1 \text{ mA}$                             | $t_r$                 | —    | 8        | —    | $\mu\text{s}$ |
| Fall Time                      |                                                                                                      | $t_f$                 | —    | 8        | —    |               |

**NOTES:**

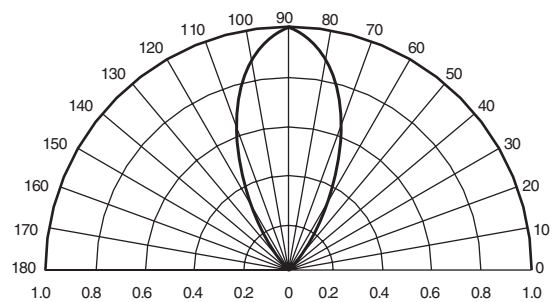
1. Derate power dissipation linearly 1.33 mW/ $^\circ\text{C}$  above  $25^\circ\text{C}$ .
2. RMA flux is recommended.
3. Methanol or isopropyl alcohols are recommended as cleaning agents.
4. Soldering iron 1/16" (1.6 mm) minimum from housing.
5.  $\lambda = 950 \text{ nm}$  GaAs.

## TYPICAL PERFORMANCE CURVES

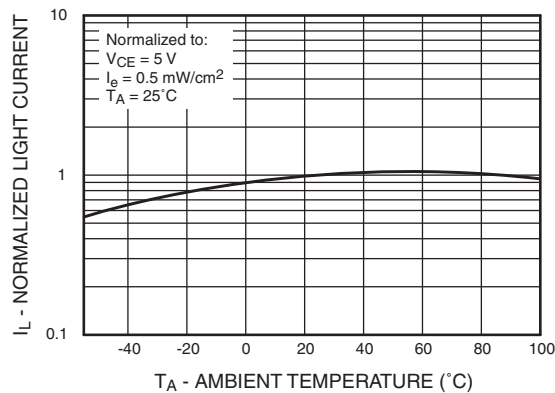
**Fig.1 Dark Current vs. Collector Emitter Voltage**



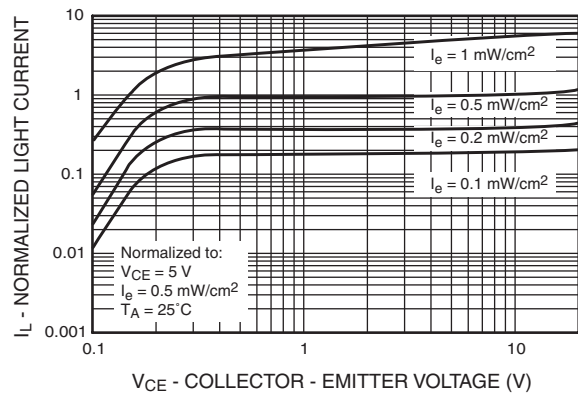
**Fig.2 Radiation Diagram**



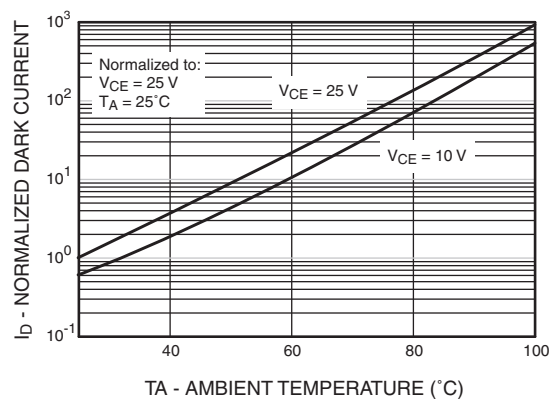
**Fig.3 Light Current vs. Ambient Temperature**



**Fig.4 Light Current vs. Collector to Emitter Voltage**



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



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2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.