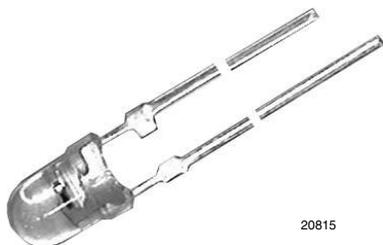


Silicon NPN Phototransistor, RoHS Compliant



DESCRIPTION

BPW85 is a silicon NPN phototransistor with high radiant sensitivity in clear, T-1 plastic package. It is sensitive to visible and near infrared radiation.

FEATURES

- Package type: leaded
- Package form: T-1
- Dimensions (in mm): \varnothing 3
- High photo sensitivity
- High radiant sensitivity
- Suitable for visible and near infrared radiation
- Fast response times
- Angle of half sensitivity: $\varphi = \pm 25^\circ$
- Lead (Pb)-free component in accordance with RoHS 2002/95/EC and WEEE 2002/96/EC



RoHS
COMPLIANT

APPLICATIONS

- Detector in electronic control and drive circuits

| PRODUCT SUMMARY | | | |
|-----------------|---------------|-----------------|----------------------|
| COMPONENT | I_{ca} (mA) | φ (deg) | $\lambda_{0.1}$ (nm) |
| BPW85A | 0.8 to 2.5 | ± 25 | 450 to 1080 |
| BPW85B | 1.5 to 4 | ± 25 | 450 to 1080 |
| BPW85C | 3 to 8 | ± 25 | 450 to 1080 |

Note

Test condition see table "Basic Characteristics"

| ORDERING INFORMATION | | | |
|----------------------|-----------|------------------------------|--------------|
| ORDERING CODE | PACKAGING | REMARKS | PACKAGE FORM |
| BPW85A | Bulk | MOQ: 5000 pcs, 5000 pcs/bulk | T-1 |
| BPW85B | Bulk | MOQ: 5000 pcs, 5000 pcs/bulk | T-1 |
| BPW85C | Bulk | MOQ: 5000 pcs, 5000 pcs/bulk | T-1 |

Note

MOQ: minimum order quantity

| ABSOLUTE MAXIMUM RATINGS | | | | |
|-------------------------------------|---|------------|---------------|------|
| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT |
| Collector emitter voltage | | V_{CEO} | 70 | V |
| Emitter collector voltage | | V_{ECO} | 5 | V |
| Collector current | | I_C | 50 | mA |
| Collector peak current | $t_p/T = 0.5, t_p \leq 10$ ms | I_{CM} | 100 | mA |
| Power dissipation | $T_{amb} \leq 55$ °C | P_V | 100 | mW |
| Junction temperature | | T_j | 100 | °C |
| Operating temperature range | | T_{amb} | - 40 to + 100 | °C |
| Storage temperature range | | T_{stg} | - 40 to + 100 | °C |
| Soldering temperature | $t \leq 3$ s, 2 mm from case | T_{sd} | 260 | °C |
| Thermal resistance junction/ambient | Connected with Cu wire \varnothing 0.14 mm ² | R_{thJA} | 450 | K/W |

Note

$T_{amb} = 25$ °C, unless otherwise specified

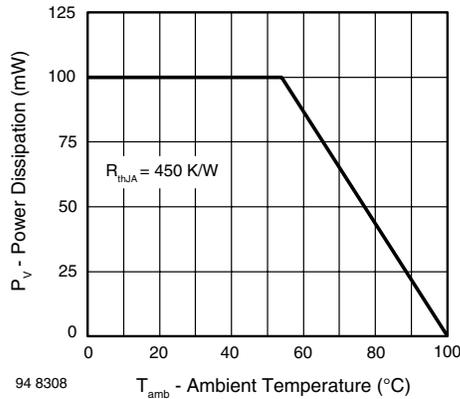


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

| BASIC CHARACTERISTICS | | | | | | |
|--------------------------------------|---|-----------------|------|-------------|------|---------------|
| PARAMETER | TEST CONDITION | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| Collector emitter breakdown voltage | $I_C = 1 \text{ mA}$ | $V_{(BR)CEO}$ | 70 | | | V |
| Collector emitter dark current | $V_{CE} = 20 \text{ V}, E = 0$ | I_{CEO} | | 1 | 200 | nA |
| Collector emitter capacitance | $V_{CE} = 5 \text{ V}, f = 1 \text{ MHz}, E = 0$ | C_{CEO} | | 3 | | pF |
| Angle of half sensitivity | | ϕ | | ± 25 | | deg |
| Wavelength of peak sensitivity | | λ_p | | 850 | | nm |
| Range of spectral bandwidth | | $\lambda_{0.1}$ | | 450 to 1080 | | nm |
| Collector emitter saturation voltage | $E_e = 1 \text{ mW/cm}^2, \lambda = 950 \text{ nm}, I_C = 0.1 \text{ mA}$ | V_{CEsat} | | | 0.3 | V |
| Turn-on time | $V_S = 5 \text{ V}, I_C = 5 \text{ mA}, R_L = 100 \Omega$ | t_{on} | | 2.0 | | μs |
| Turn-off time | $V_S = 5 \text{ V}, I_C = 5 \text{ mA}, R_L = 100 \Omega$ | t_{off} | | 2.3 | | μs |
| Cut-off frequency | $V_S = 5 \text{ V}, I_C = 5 \text{ mA}, R_L = 100 \Omega$ | f_c | | 180 | | kHz |

Note

$T_{amb} = 25 \text{ }^\circ\text{C}$, unless otherwise specified

| TYPE DEDICATED CHARACTERISTICS | | | | | | | |
|--------------------------------|---|--------|----------|------|------|------|------|
| PARAMETER | TEST CONDITION | PART | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| Collector light current | $E_e = 1 \text{ mW/cm}^2, \lambda = 950 \text{ nm}, V_{CE} = 5 \text{ V}$ | BPW85A | I_{ca} | 0.8 | | 2.5 | mA |
| | | BPW85B | I_{ca} | 1.5 | | 4.0 | mA |
| | | BPW85C | I_{ca} | 3.0 | | 8.0 | mA |

BASIC CHARACTERISTICS

$T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified

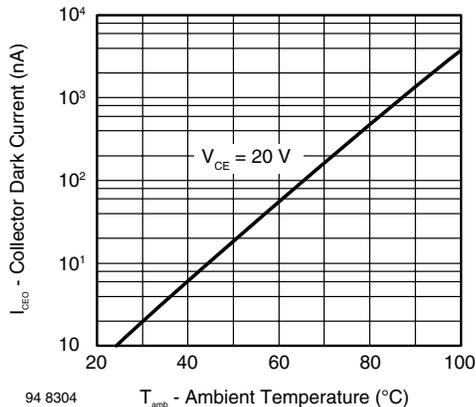


Fig. 2 - Collector Dark Current vs. Ambient Temperature

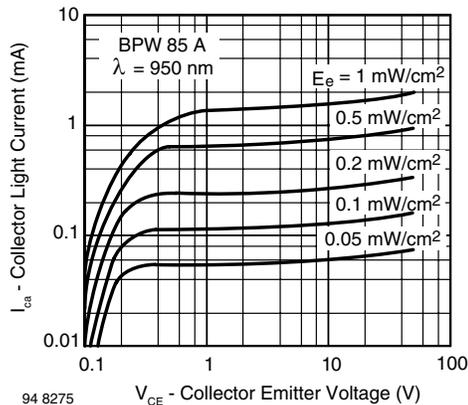


Fig. 5 - Collector Light Current vs. Collector Emitter Voltage

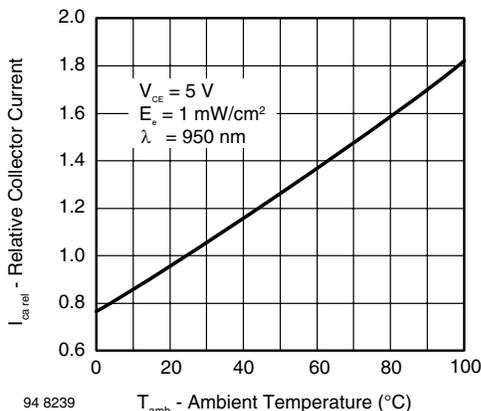


Fig. 3 - Relative Collector Current vs. Ambient Temperature

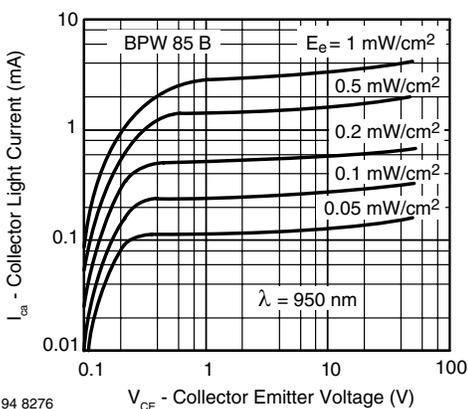


Fig. 6 - Collector Light Current vs. Collector Emitter Voltage

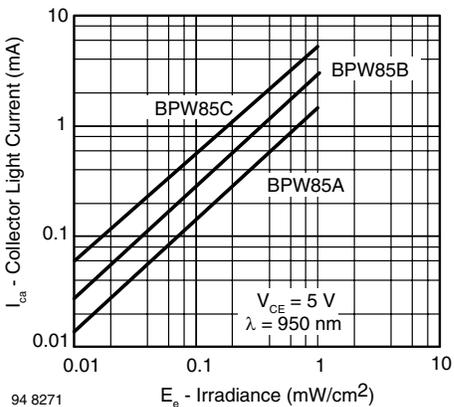


Fig. 4 - Collector Light Current vs. Irradiance

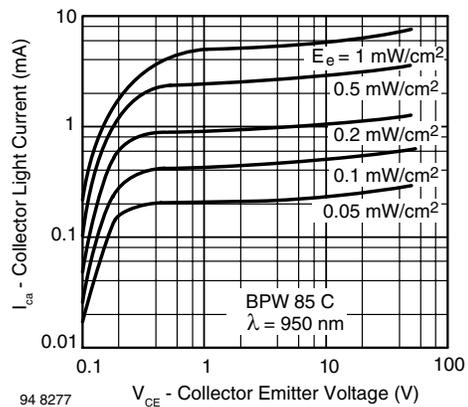


Fig. 7 - Collector Light Current vs. Collector Emitter Voltage

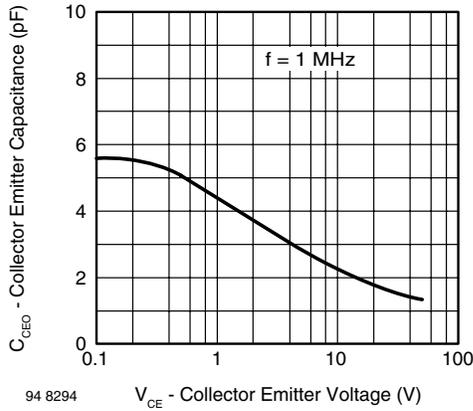


Fig. 8 - Collector Emitter Capacitance vs. Collector Emitter Voltage

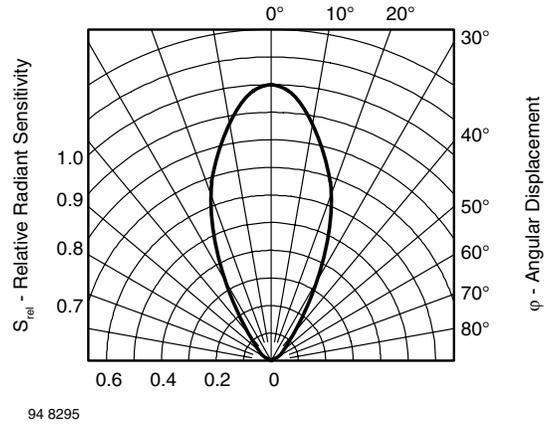


Fig. 11 - Relative Radiant Sensitivity vs. Angular Displacement

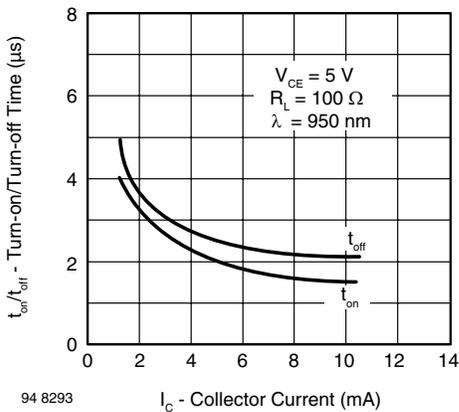


Fig. 9 - Turn-on/Turn-off Time vs. Collector Current

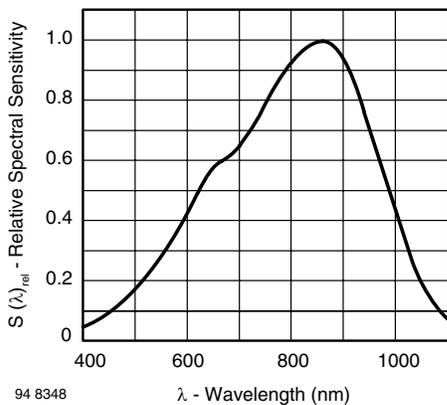


Fig. 10 - Relative Spectral Sensitivity vs. Wavelength



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