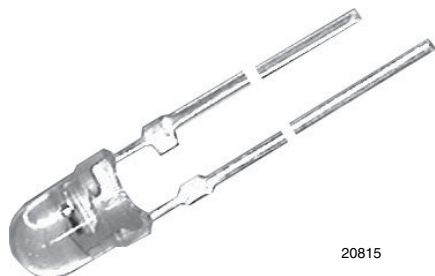


Silicon NPN Phototransistor



20815

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: $\phi = \pm 25^\circ$
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

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.

APPLICATIONS

- Detector in electronic control and drive circuits

PRODUCT SUMMARY

| COMPONENT | I_{ca} (mA) | ϕ (deg) | $\lambda_{0.1}$ (nm) |
|-----------|---------------|--------------|----------------------|
| BPW85 | 0.8 to 8 | ± 25 | 450 to 1080 |
| 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 |
|---------------|-----------|------------------------------|--------------|
| BPW85 | Bulk | MOQ: 5000 pcs, 5000 pcs/bulk | T-1 |
| 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 ($T_{amb} = 25^\circ\text{C}$, unless otherwise specified)

| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT |
|-------------------------------------|--|------------|-------------|------------------|
| Collector emitter voltage | | V_{CE0} | 70 | V |
| Emitter collector voltage | | V_{ECO} | 5 | V |
| Collector current | | I_C | 50 | mA |
| Collector peak current | $t_p/T = 0.5, t_p \leq 10 \text{ ms}$ | I_{CM} | 100 | mA |
| Power dissipation | $T_{amb} \leq 55^\circ\text{C}$ | P_V | 100 | mW |
| Junction temperature | | T_j | 100 | $^\circ\text{C}$ |
| Operating temperature range | | T_{amb} | -40 to +100 | $^\circ\text{C}$ |
| Storage temperature range | | T_{stg} | -40 to +100 | $^\circ\text{C}$ |
| Soldering temperature | $t \leq 3 \text{ s}, 2 \text{ mm from case}$ | T_{sd} | 260 | $^\circ\text{C}$ |
| Thermal resistance junction/ambient | Connected with Cu wire $\varnothing 0.14 \text{ mm}^2$ | R_{thJA} | 450 | K/W |

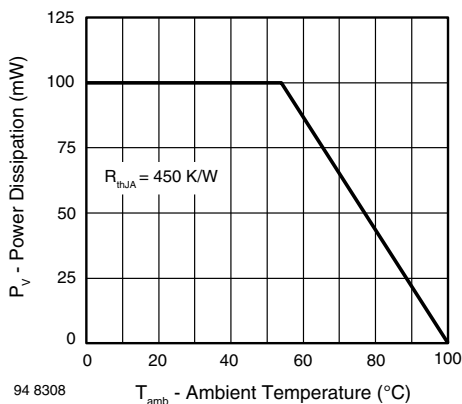


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

| BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) | | | | | | |
|---|---|-----------------|------|-------------|------|---------------|
| 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 | $V_S = 5\text{ V}$, $I_C = 5\text{ mA}$, $R_L = 100\text{ }\Omega$ | t_{on} | | 2.0 | | μs |
| Turn-off time | $V_S = 5\text{ V}$, $I_C = 5\text{ mA}$, $R_L = 100\text{ }\Omega$ | t_{off} | | 2.3 | | μs |
| Cut-off frequency | $V_S = 5\text{ V}$, $I_C = 5\text{ mA}$, $R_L = 100\text{ }\Omega$ | f_c | | 180 | | kHz |

| TYPE DEDICATED CHARACTERISTICS | | | | | | | |
|---------------------------------------|---|--------|----------|------|------|------|------|
| PARAMETER | TEST CONDITION | PART | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| Collector light current | $E_e = 1\text{ mW/cm}^2$, $\lambda = 950\text{ nm}$, $V_{CE} = 5\text{ V}$ | BPW85 | I_{ca} | 0.8 | | 8.0 | mA |
| | | 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)

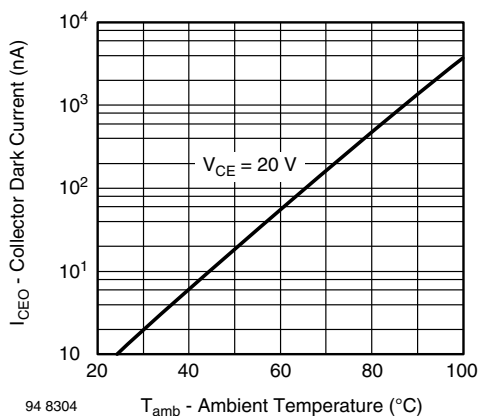


Fig. 2 - Collector Dark Current vs. Ambient Temperature

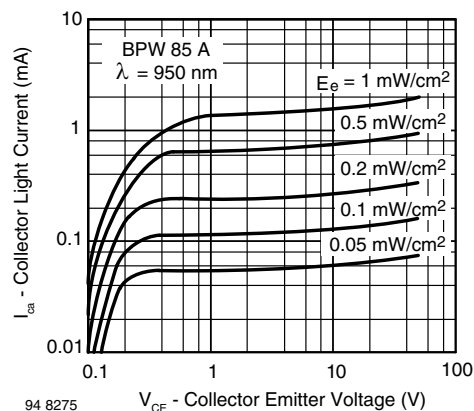


Fig. 5 - Collector Light Current vs. Collector Emitter Voltage

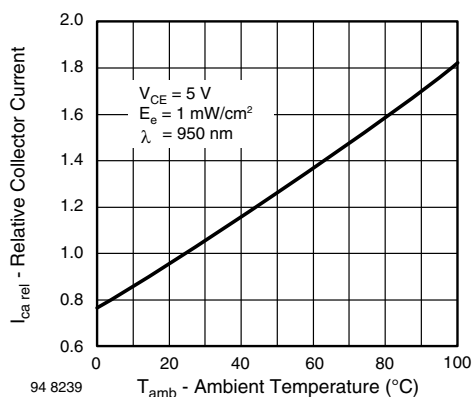


Fig. 3 - Relative Collector Current vs. Ambient Temperature

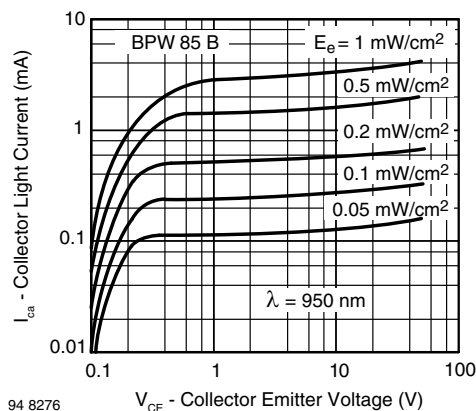


Fig. 6 - Collector Light Current vs. Collector Emitter Voltage

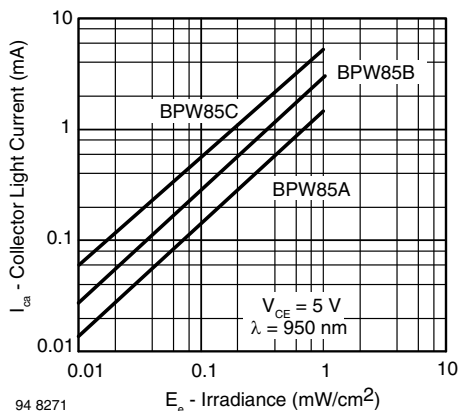


Fig. 4 - Collector Light Current vs. Irradiance

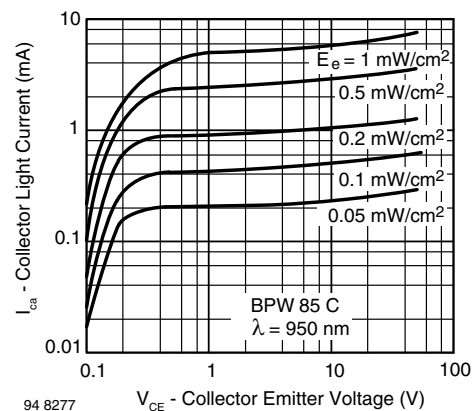


Fig. 7 - Collector Light Current vs. Collector Emitter Voltage

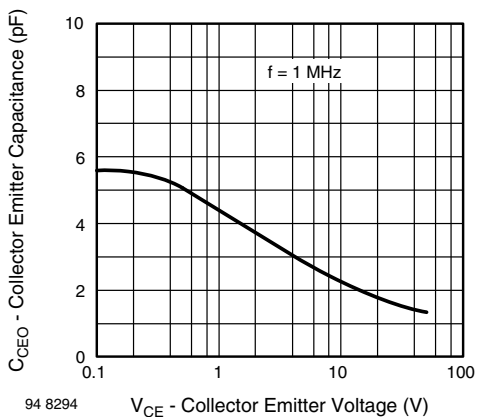


Fig. 8 - Collector Emitter Capacitance vs. Collector Emitter Voltage

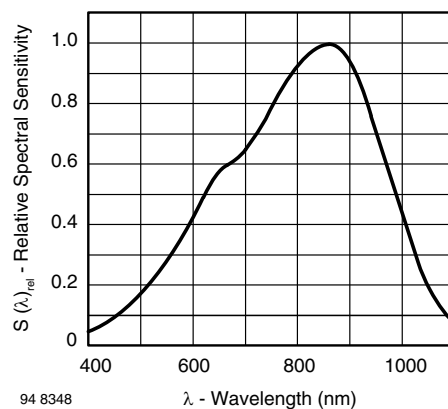


Fig. 10 - Relative Spectral Sensitivity vs. Wavelength

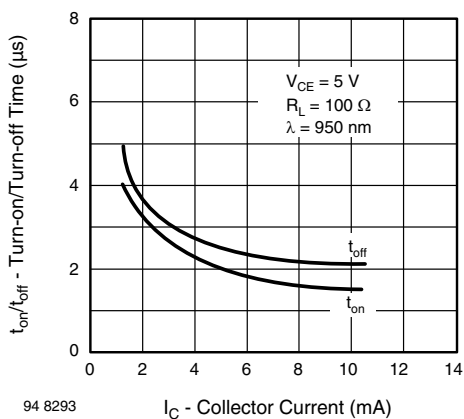


Fig. 9 - Turn-on/Turn-off Time vs. Collector Current

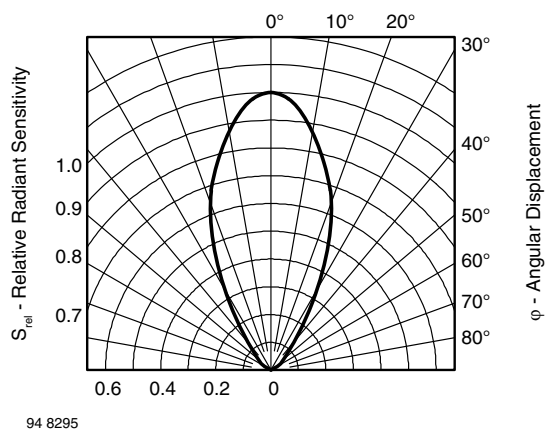
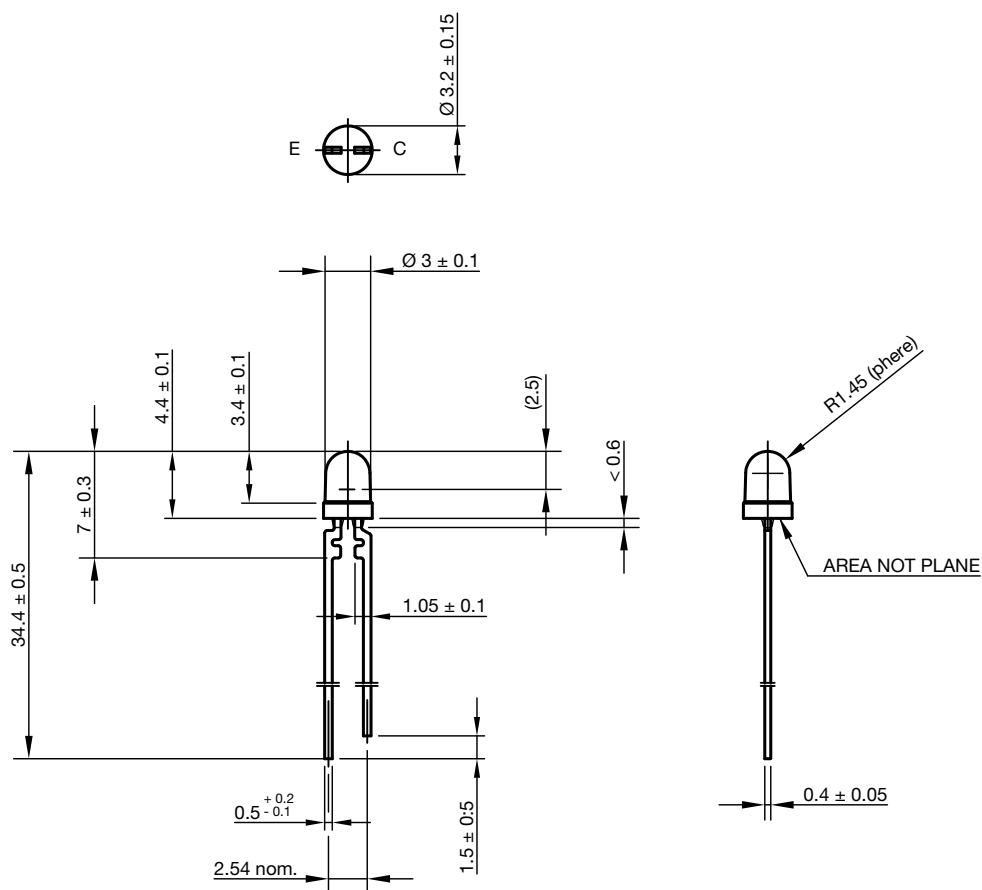


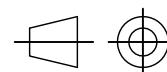
Fig. 11 - Relative Radiant Sensitivity vs. Angular Displacement



PACKAGE DIMENSIONS in millimeters



Drawing-No.: 6.544-5054.01-4
Issue: 5; 28.07.14



technical drawings
according to DIN
specifications



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