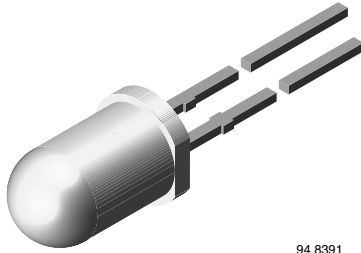


## Silicon NPN Phototransistor



94 8391

### DESCRIPTION

BPW96 is a silicon NPN phototransistor with high radiant sensitivity in clear, T-1 $\frac{1}{4}$  plastic package. It is sensitive to visible and near infrared radiation.

### FEATURES

- Package type: leaded
- Package form: T-1 $\frac{1}{4}$
- Dimensions (in mm):  $\varnothing$  5
- Leads with stand-off
- High photo sensitivity
- High radiant sensitivity
- Suitable for visible and near infrared radiation
- Fast response times
- Angle of half sensitivity:  $\varphi = \pm 20^\circ$
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC



### Note

\*\* Please see document "Vishay Material Category Policy": [www.vishay.com/doc?99902](http://www.vishay.com/doc?99902)

### APPLICATIONS

- Detector in electronic control and drive circuits

| PRODUCT SUMMARY |               |                 |                      |
|-----------------|---------------|-----------------|----------------------|
| COMPONENT       | $I_{ca}$ (mA) | $\varphi$ (deg) | $\lambda_{0.1}$ (nm) |
| BPW96B          | 2.5 to 7.5    | $\pm 20$        | 450 to 1080          |
| BPW96C          | 4.5 to 15     | $\pm 20$        | 450 to 1080          |

### Note

- Test condition see table "Basic Characteristics"

| ORDERING INFORMATION |           |                              |                   |
|----------------------|-----------|------------------------------|-------------------|
| ORDERING CODE        | PACKAGING | REMARKS                      | PACKAGE FORM      |
| BPW96B               | Bulk      | MOQ: 4000 pcs, 4000 pcs/bulk | T-1 $\frac{1}{4}$ |
| BPW96C               | Bulk      | MOQ: 4000 pcs, 4000 pcs/bulk | T-1 $\frac{1}{4}$ |

### 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   |  | $V_{CEO}$  | 70            | V                |
| Emitter collector voltage   |  | $V_{ECO}$  | 5             | V                |
| Collector current   |  | $I_C$      | 50            | mA               |
| Collector peak current  | $t_p/T \leq 0.5$ , $t_p \leq 10$ ms          | $I_{CM}$   | 100           | mA               |
| Power dissipation   | $T_{amb} \leq 47^\circ\text{C}$              | $P_V$      | 150           | 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   | $t \leq 3$ s                                 | $T_{sd}$   | 260           | $^\circ\text{C}$ |
| Thermal resistance junction/ambient   | Connected with Cu wire, 0.14 mm <sup>2</sup> | $R_{thJA}$ | 350           | K/W              |

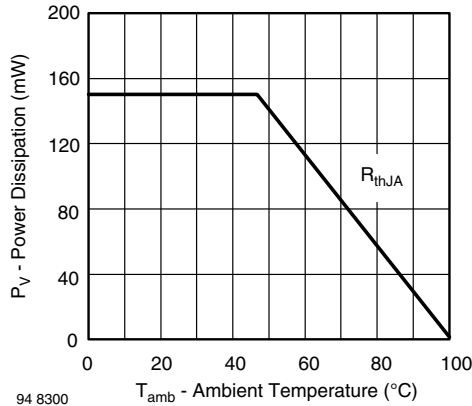


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

| <b>BASIC CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , 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   |  | $\varphi$       |      | $\pm 20$    |      | deg           |
| Wavelength of peak sensitivity  |  | $\lambda_p$     |      | 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         |      | $\mu\text{s}$ |
| Turn-off time   | $V_S = 5\text{ V}, I_C = 5\text{ mA}, R_L = 100\text{ }\Omega$         | $t_{off}$       |      | 2.3         |      | $\mu\text{s}$ |
| Cut-off frequency   | $V_S = 5\text{ V}, I_C = 5\text{ mA}, R_L = 100\text{ }\Omega$         | $f_c$           |      | 180         |      | kHz           |

| <b>TYPE DEDICATED CHARACTERISTICS</b> |  |        |          |      |      |      |      |
|---------------------------------------|--|--------|----------|------|------|------|------|
| PARAMETER                             | TEST CONDITION   | PART   | SYMBOL   | MIN. | TYP. | MAX. | UNIT |
| Collector light current               | $E_e = 1\text{ mW/cm}^2, \lambda = 950\text{ nm}, V_{CE} = 5\text{ V}$ | BPW96B | $I_{ca}$ | 2.5  | 4.5  | 7.5  | mA   |
|                                       |  | BPW96C | $I_{ca}$ | 4.5  | 8    | 15   | mA   |

**BASIC CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

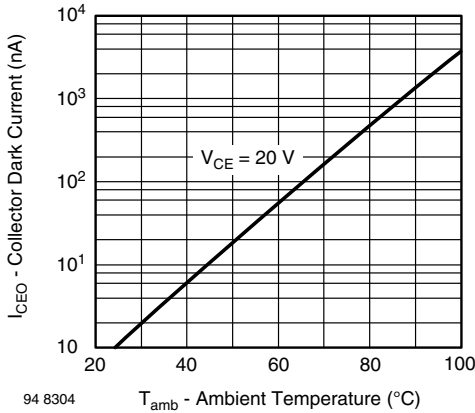


Fig. 1 - Collector Dark Current vs. Ambient Temperature

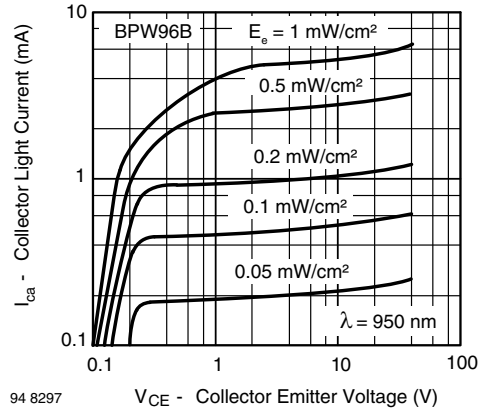


Fig. 4 - Collector Light Current vs. Collector Emitter Voltage

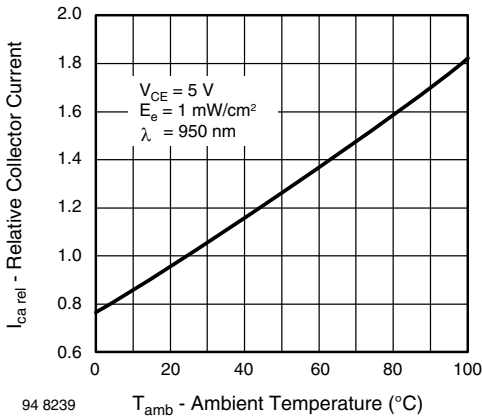


Fig. 2 - Relative Collector Current vs. Ambient Temperature

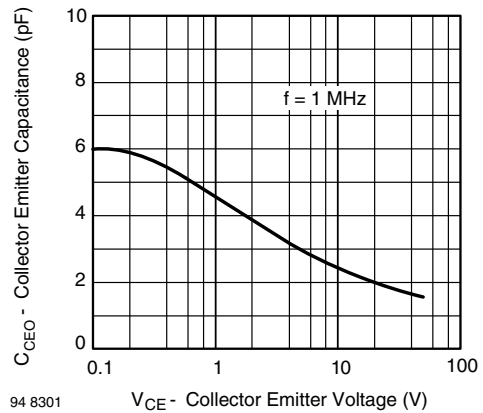


Fig. 5 - Collector Emitter Capacitance vs. Collector Emitter Voltage

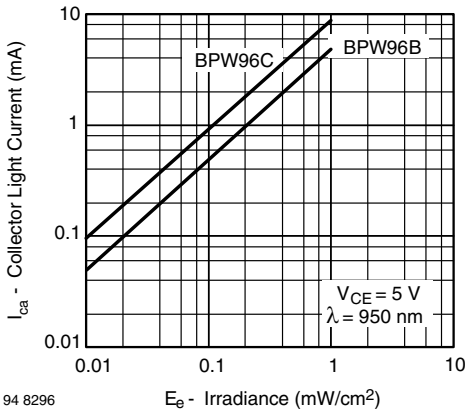


Fig. 3 - Collector Light Current vs. Irradiance

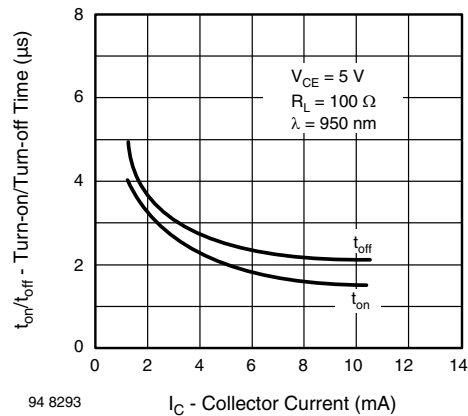


Fig. 6 - Turn-on/Turn-off Time vs. Collector Current

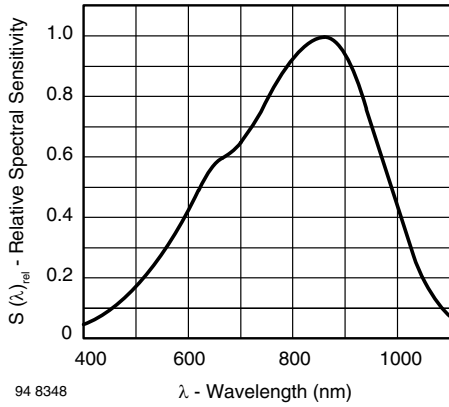


Fig. 7 - Relative Spectral Sensitivity vs. Wavelength

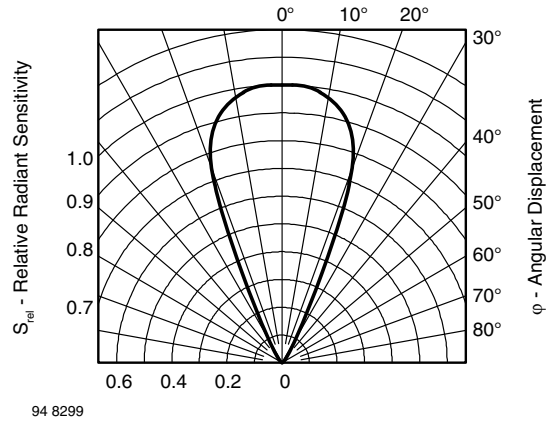
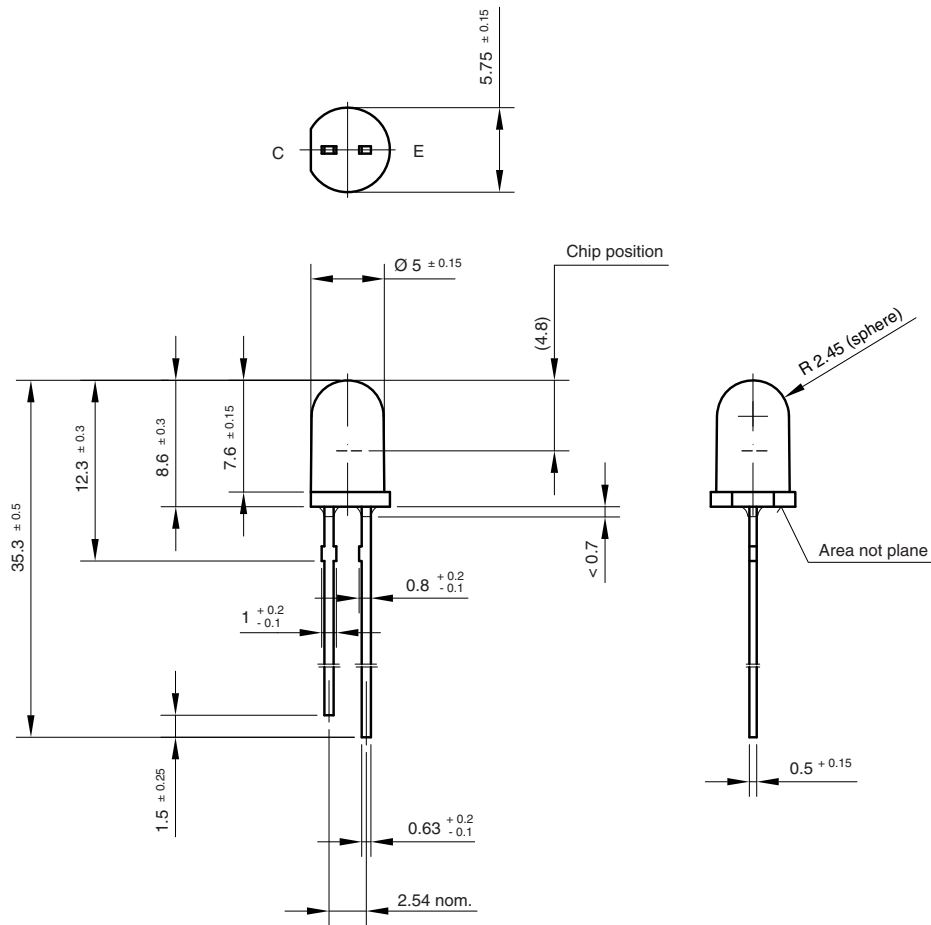


Fig. 8 - Relative Radiant Sensitivity vs. Angular Displacement

**PACKAGE DIMENSIONS** in millimeters



technical drawings according to DIN specifications

Drawing-No.: 6.544-5086.01-4

Issue:1; 01.07.96

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