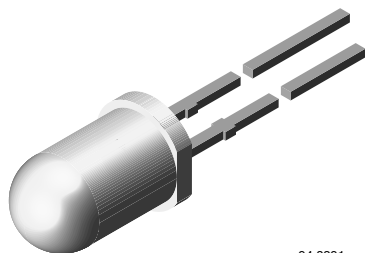


## Silicon NPN Phototransistor



94 8391

### DESCRIPTION

BPW96 is a silicon NPN phototransistor with high radiant sensitivity in clear, T-1 $\frac{3}{4}$  plastic package. It is sensitive to visible and near infrared radiation.

### FEATURES

- Package type: leaded
- Package form: T-1 $\frac{3}{4}$
- 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:  $\phi = \pm 20^\circ$
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC



**RoHS**  
COMPLIANT  
**GREEN**  
(5-2008)\*\*

### 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 <sub>ca</sub> (mA) | $\phi$ (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 $\frac{3}{4}$ |
| BPW96C        | Bulk      | MOQ: 4000 pcs, 4000 pcs/bulk | T-1 $\frac{3}{4}$ |

### Note

- MOQ: minimum order quantity

### ABSOLUTE MAXIMUM RATINGS (T<sub>amb</sub> = 25 °C, unless otherwise specified)

| PARAMETER                           | TEST CONDITION                                            | SYMBOL            | VALUE         | UNIT |
|-------------------------------------|-----------------------------------------------------------|-------------------|---------------|------|
| Collector emitter voltage           |                                                           | V <sub>CEO</sub>  | 70            | V    |
| Emitter collector voltage           |                                                           | V <sub>ECO</sub>  | 5             | V    |
| Collector current                   |                                                           | I <sub>C</sub>    | 50            | mA   |
| Collector peak current              | t <sub>p</sub> /T $\leq$ 0.5, t <sub>p</sub> $\leq$ 10 ms | I <sub>CM</sub>   | 100           | mA   |
| Power dissipation                   | T <sub>amb</sub> $\leq$ 47 °C                             | P <sub>V</sub>    | 150           | mW   |
| Junction temperature                |                                                           | T <sub>j</sub>    | 100           | °C   |
| Operating temperature range         |                                                           | T <sub>amb</sub>  | - 40 to + 100 | °C   |
| Storage temperature range           |                                                           | T <sub>stg</sub>  | - 40 to + 100 | °C   |
| Soldering temperature               | t $\leq$ 3 s                                              | T <sub>sd</sub>   | 260           | °C   |
| Thermal resistance junction/ambient | Connected with Cu wire, 0.14 mm <sup>2</sup>              | R <sub>thJA</sub> | 350           | K/W  |

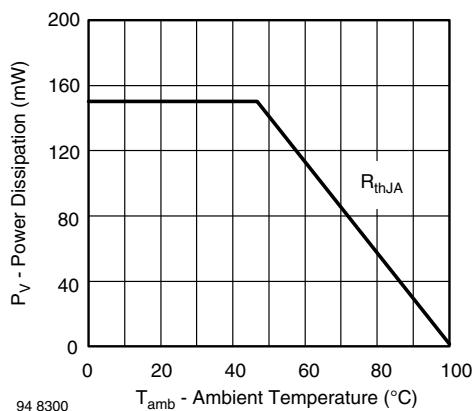


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

| <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                                                                           |                                                                        | $\phi$          |      | $\pm 20$    |      | 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)

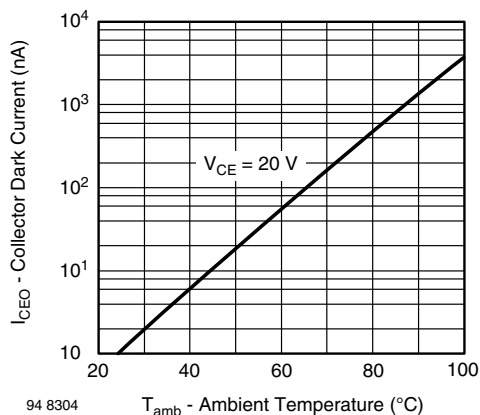


Fig. 1 - Collector Dark Current vs. Ambient Temperature

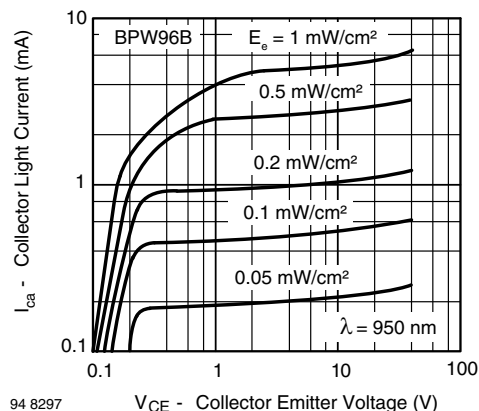


Fig. 4 - Collector Light Current vs. Collector Emitter Voltage

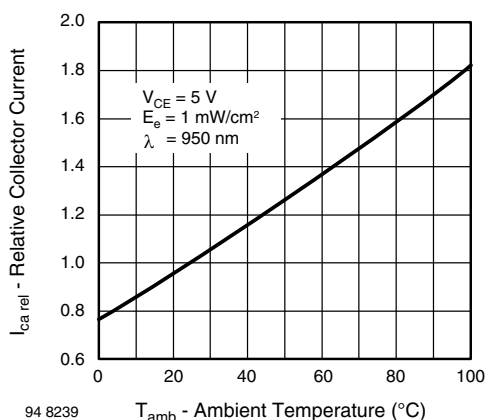


Fig. 2 - Relative Collector Current vs. Ambient Temperature

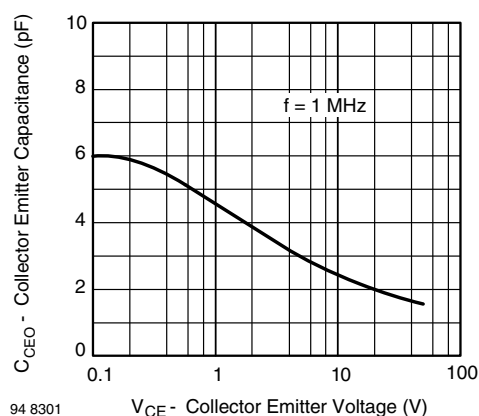


Fig. 5 - Collector Emitter Capacitance vs. Collector Emitter Voltage

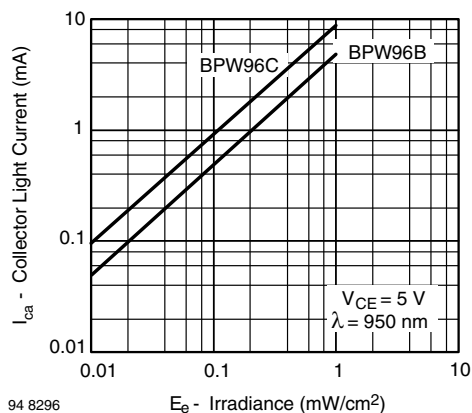


Fig. 3 - Collector Light Current vs. Irradiance

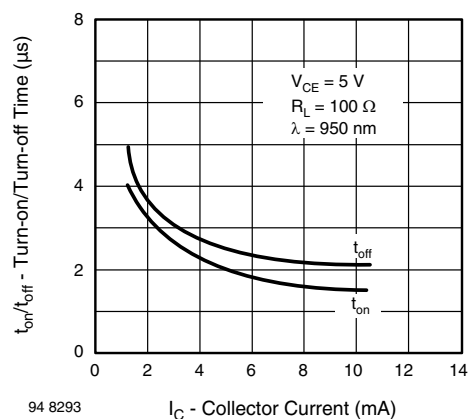


Fig. 6 - Turn-on/Turn-off Time vs. Collector Current

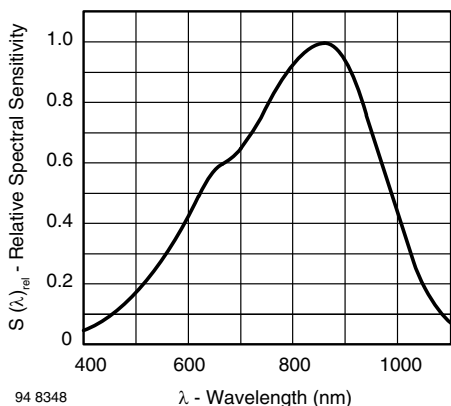


Fig. 7 - Relative Spectral Sensitivity vs. Wavelength

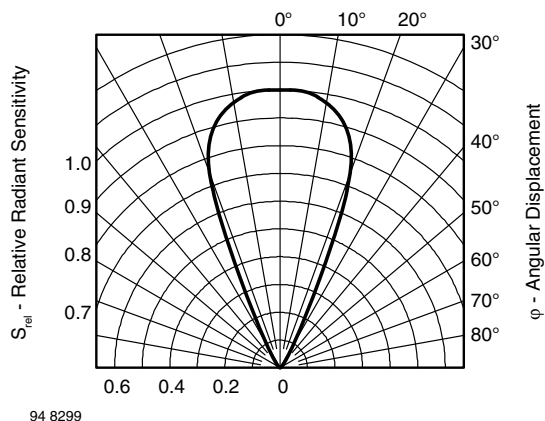
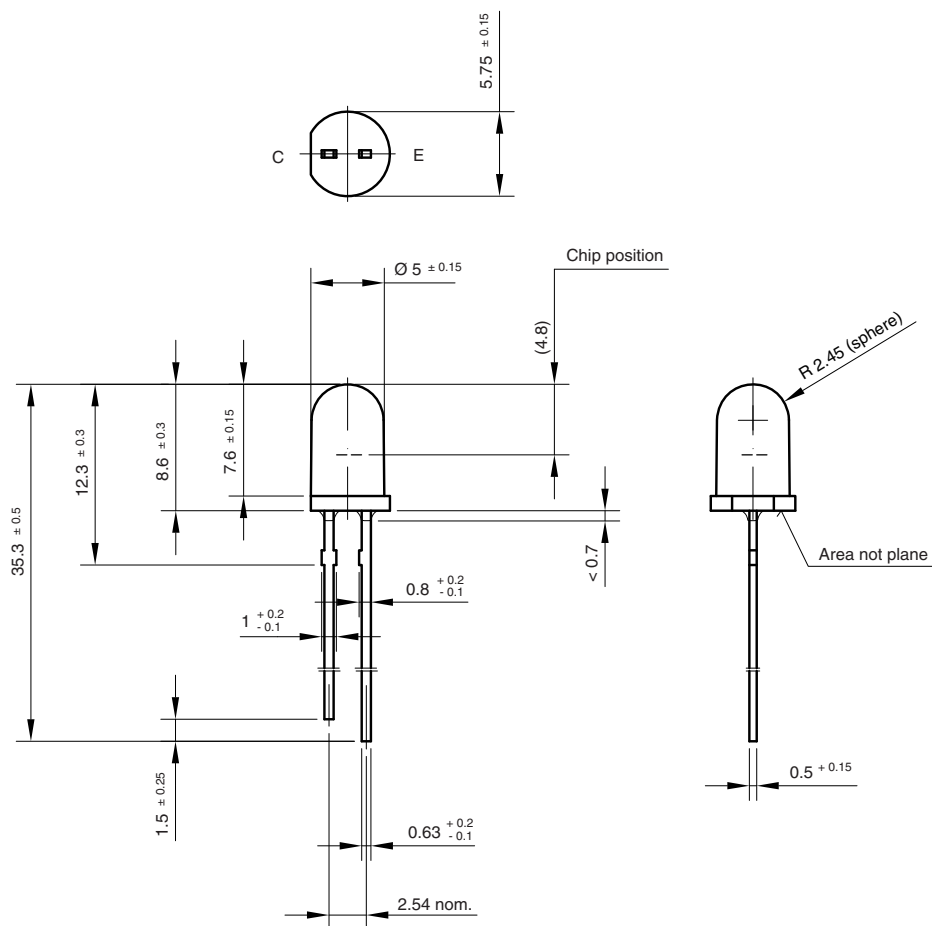


Fig. 8 - Relative Radiant Sensitivity vs. Angular Displacement

### PACKAGE DIMENSIONS in millimeters



Drawing-No.: 6.544-5086.01-4

Issue:1; 01.07.96

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