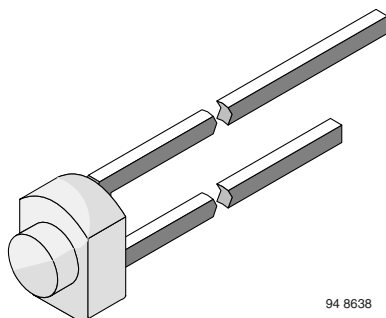


## Silicon NPN Phototransistor, RoHS Compliant



94 8638

### FEATURES

- Package type: leaded
- Package form: T-¾
- Dimensions (in mm): Ø 1.8
- High photo sensitivity
- High radiant sensitivity
- Suitable for visible and near infrared radiation
- Fast response times
- Angle of half sensitivity:  $\phi = \pm 40^\circ$
- Lead (Pb)-free component in accordance with RoHS 2002/95/EC and WEEE 2002/96/EC


**RoHS**  
COMPLIANT

### DESCRIPTION

BPW16N is a silicon NPN phototransistor with high radiant sensitivity in clear, T-¾ plastic package with flat window. It is sensitive to visible and near infrared radiation. On PCB this package size enables assembly of arrays with 2.54 mm pitch.

### APPLICATIONS

- Detector in electronic control and drive circuits

### PRODUCT SUMMARY

| COMPONENT | $I_{ca}$ (mA) | $\phi$ (deg) | $\lambda_{0.1}$ (nm) |
|-----------|---------------|--------------|----------------------|
| BPW16N    | 0.14          | $\pm 40$     | 450 to 1040          |

#### Note

Test condition see table "Basic Characteristics"

### ORDERING INFORMATION

| ORDERING CODE | PACKAGING | REMARKS                      | PACKAGE FORM |
|---------------|-----------|------------------------------|--------------|
| BPW16N        | Bulk      | MOQ: 5000 pcs, 5000 pcs/bulk | T-¾          |

#### Note

MOQ: minimum order quantity

### ABSOLUTE MAXIMUM RATINGS

| PARAMETER                           | TEST CONDITION                               | SYMBOL     | VALUE         | UNIT |
|-------------------------------------|----------------------------------------------|------------|---------------|------|
| Collector emitter voltage           |                                              | $V_{CEO}$  | 32            | 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                                 | $T_{sd}$   | 260           | °C   |
| Thermal resistance junction/ambient | Connected with Cu wire, 0.14 mm <sup>2</sup> | $R_{thJA}$ | 450           | K/W  |

#### Note

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

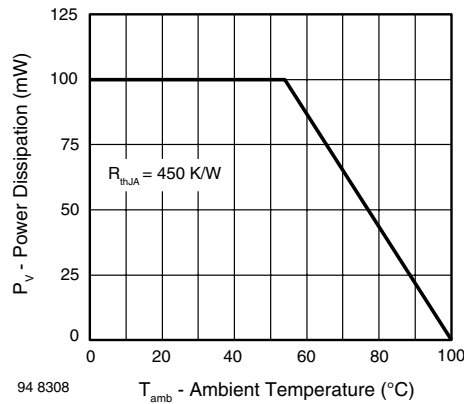


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

| BASIC CHARACTERISTICS                |                                                                            |                 |      |             |      |               |
|--------------------------------------|----------------------------------------------------------------------------|-----------------|------|-------------|------|---------------|
| PARAMETER                            | TEST CONDITION                                                             | SYMBOL          | MIN. | TYP.        | MAX. | UNIT          |
| Collector emitter breakdown voltage  | $I_C = 1 \text{ mA}$                                                       | $V_{(BR)CEO}$   | 32   |             |      | V             |
| Collector emitter dark current       | $V_{CE} = 20 \text{ V}, E = 0$                                             | $I_{CEO}$       |      | 1           | 200  | nA            |
| Collector emitter capacitance        | $V_{CE} = 5 \text{ V}, f = 1 \text{ MHz}, E = 0$                           | $C_{CEO}$       |      | 8           |      | pF            |
| Collector light current              | $E_e = 1 \text{ mW/cm}^2, \lambda = 950 \text{ nm}, V_{CE} = 5 \text{ V}$  | $I_{ca}$        | 0.07 | 0.14        |      | mA            |
| Angle of half sensitivity            |                                                                            | $\varphi$       |      | $\pm 40$    |      | deg           |
| Wavelength of peak sensitivity       |                                                                            | $\lambda_p$     |      | 825         |      | nm            |
| Range of spectral bandwidth          |                                                                            | $\lambda_{0.1}$ |      | 450 to 1040 |      | nm            |
| Collector emitter saturation voltage | $E_e = 1 \text{ mW/cm}^2, \lambda = 950 \text{ nm}, I_C = 0.01 \text{ mA}$ | $V_{CEsat}$     |      |             | 0.3  | V             |
| Turn-on time                         | $V_S = 5 \text{ V}, I_C = 5 \text{ mA}, R_L = 100 \Omega$                  | $t_{on}$        |      | 4.8         |      | $\mu\text{s}$ |
| Turn-off time                        | $V_S = 5 \text{ V}, I_C = 5 \text{ mA}, R_L = 100 \Omega$                  | $t_{off}$       |      | 5.0         |      | $\mu\text{s}$ |
| Cut-off frequency                    | $V_S = 5 \text{ V}, I_C = 5 \text{ mA}, R_L = 100 \Omega$                  | $f_c$           |      | 120         |      | kHz           |

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

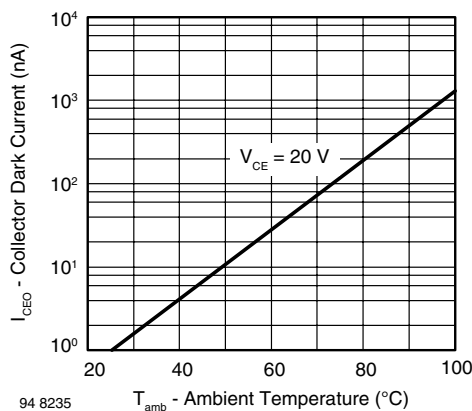
**BASIC CHARACTERISTICS**
 $T_{amb} = 25^\circ\text{C}$ , unless otherwise specified


Fig. 2 - Collector Dark Current vs. Ambient Temperature

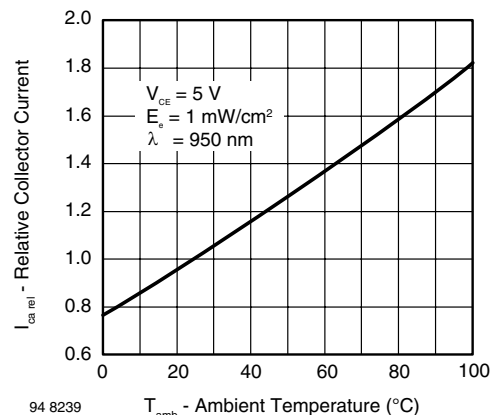


Fig. 3 - Relative Collector Current vs. Ambient Temperature

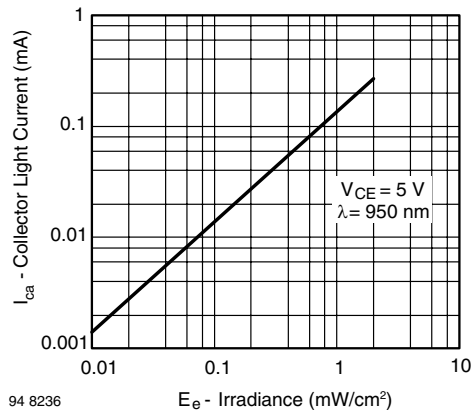


Fig. 4 - Collector Light Current vs. Irradiance

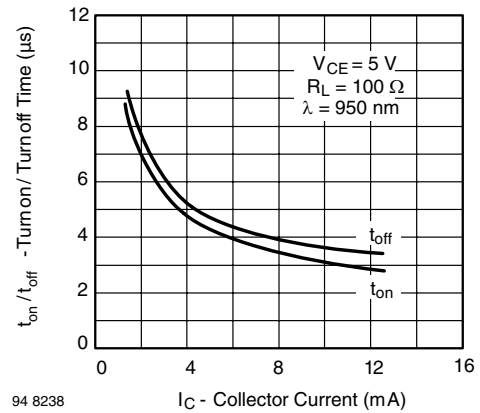


Fig. 7 - Turn-on/Turn-off Time vs. Collector Current

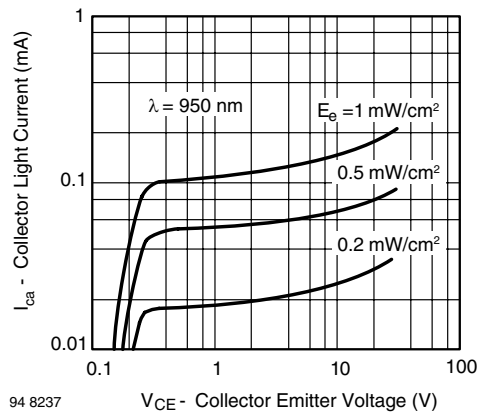


Fig. 5 - Collector Light Current vs. Collector Emitter Voltage

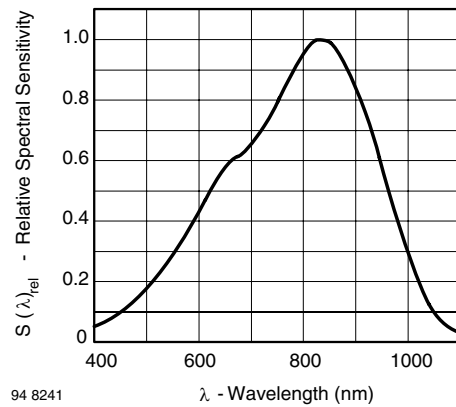


Fig. 8 - Relative Spectral Sensitivity vs. Wavelength

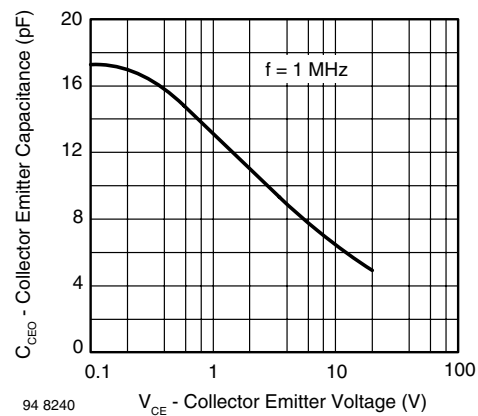


Fig. 6 - Collector Emitter Capacitance vs. Collector Emitter Voltage

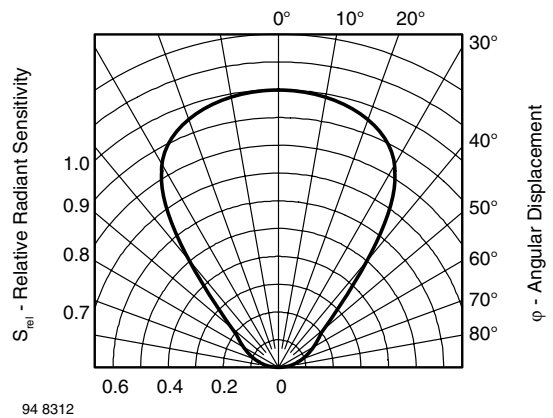
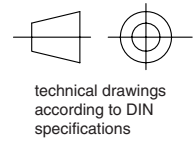
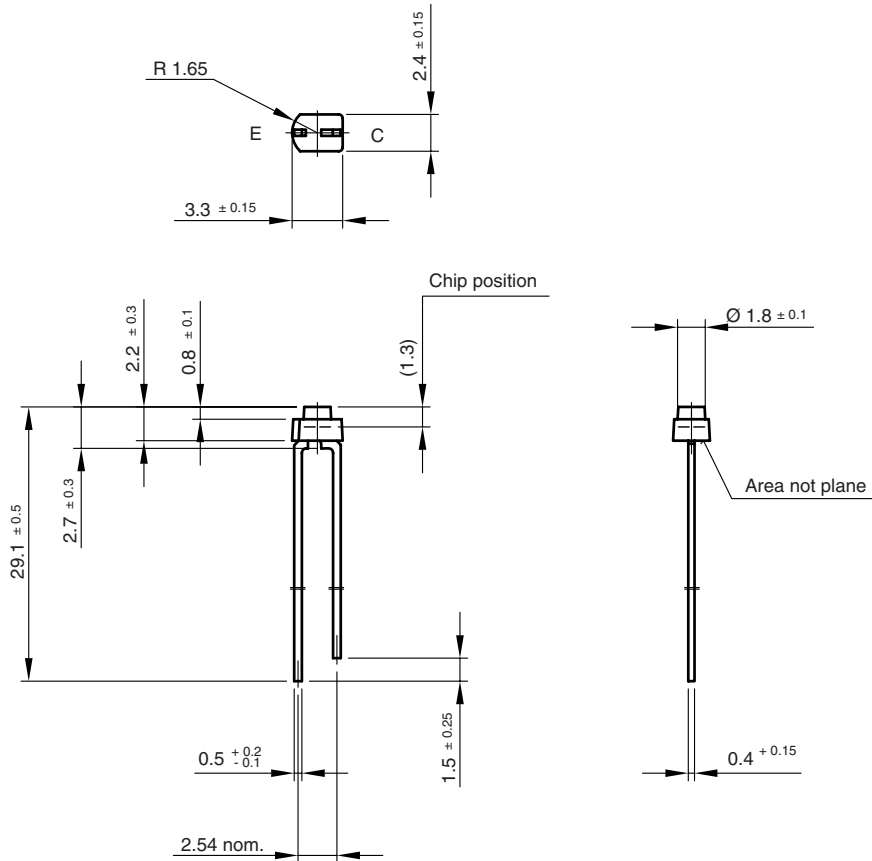


Fig. 9 - Relative Radiant Sensitivity vs. Angular Displacement

**PACKAGE DIMENSIONS** in millimeters

6.544-5047.01-4  
Issue: 2; 19.12.00  
96 12188



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