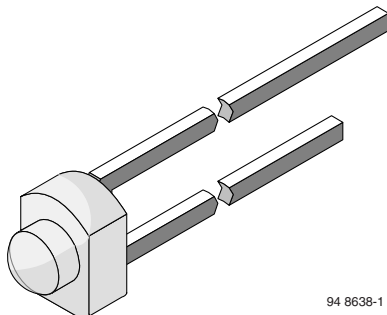


## Silicon NPN Phototransistor



### FEATURES

- Package type: leaded
- Package form: T-3/4
- Dimensions (in mm):  $\varnothing$  1.8
- High photo sensitivity
- High radiant sensitivity
- Suitable for visible and near infrared radiation
- Fast response times
- Angle of half sensitivity:  $\phi = \pm 12^\circ$
- 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)

### DESCRIPTION

BPW17N is a silicon NPN phototransistor with high radiant sensitivity in clear, T-3/4 plastic package with lens. 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) |
|-----------|---------------|--------------|----------------------|
| BPW17N    | 1.0           | $\pm 12$     | 450 to 1040          |

### Note

- Test condition see table "Basic Characteristics"

### ORDERING INFORMATION

| ORDERING CODE | PACKAGING | REMARKS                      | PACKAGE FORM |
|---------------|-----------|------------------------------|--------------|
| BPW17N        | Bulk      | MOQ: 5000 pcs, 5000 pcs/bulk | T-3/4        |

### 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           |                                              | $V_{CEO}$  | 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                   | $T_{amb} \leq 55^\circ\text{C}$              | $P_V$      | 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               | $t \leq 3$ s                                 | $T_{sd}$   | 260           | $^\circ\text{C}$ |
| Thermal resistance junction/ambient | Connected with Cu wire, 0.14 mm <sup>2</sup> | $R_{thJA}$ | 450           | K/W              |

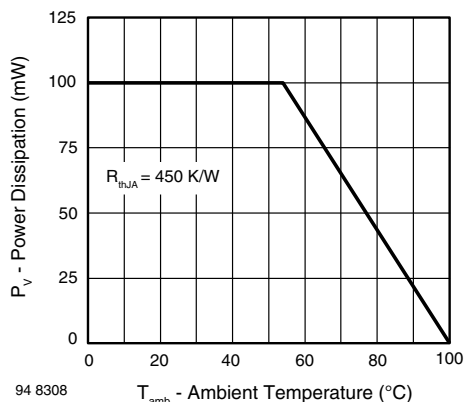


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

| BASIC CHARACTERISTICS ( $T_{amb} = 25^{\circ}\text{C}$ , unless otherwise specified) |                                                                        |                 |      |             |      |               |
|--------------------------------------------------------------------------------------|------------------------------------------------------------------------|-----------------|------|-------------|------|---------------|
| PARAMETER                                                                            | TEST CONDITION                                                         | SYMBOL          | MIN. | TYP.        | MAX. | UNIT          |
| Collector emitter breakdown voltage                                                  | $I_C = 1\text{ mA}$                                                    | $V_{(BR)CEO}$   | 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                                                              | $E_e = 1\text{ mW/cm}^2, \lambda = 950\text{ nm}, V_{CE} = 5\text{ V}$ | $I_{ca}$        | 0.5  | 1.0         |      | mA            |
| Angle of half sensitivity                                                            |                                                                        | $\phi$          |      | $\pm 12$    |      | deg           |
| Wavelength of peak sensitivity                                                       |                                                                        | $\lambda_p$     |      | 825         |      | nm            |
| Range of spectral bandwidth                                                          |                                                                        | $\lambda_{0.1}$ |      | 450 to 1040 |      | nm            |
| Collector emitter saturation voltage                                                 | $E_e = 1\text{ mW/cm}^2, \lambda = 950\text{ nm}, I_C = 0.1\text{ mA}$ | $V_{CEsat}$     |      |             | 0.3  | V             |
| Turn-on time                                                                         | $V_S = 5\text{ V}, I_C = 5\text{ mA}, R_L = 100\ \Omega$               | $t_{on}$        |      | 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           |

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

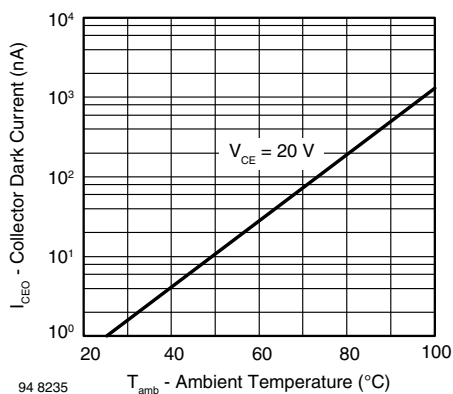


Fig. 1 - Collector Dark Current vs. Ambient Temperature

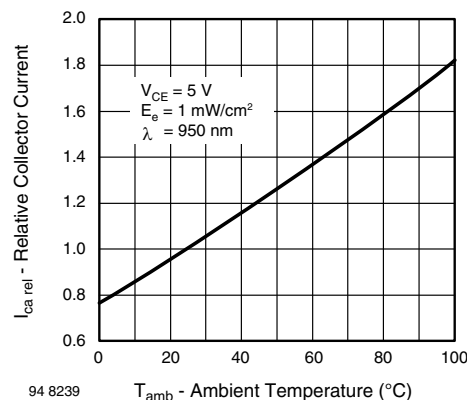


Fig. 2 - Relative Collector Current vs. Ambient Temperature

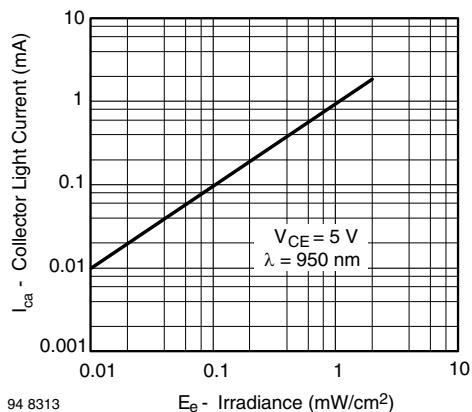


Fig. 3 - Collector Light Current vs. Irradiance

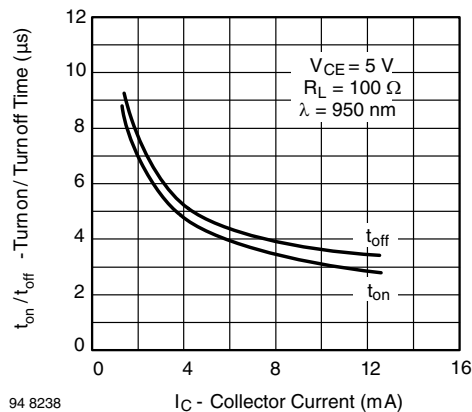


Fig. 6 - Turn-on/Turn-off Time vs. Collector Current

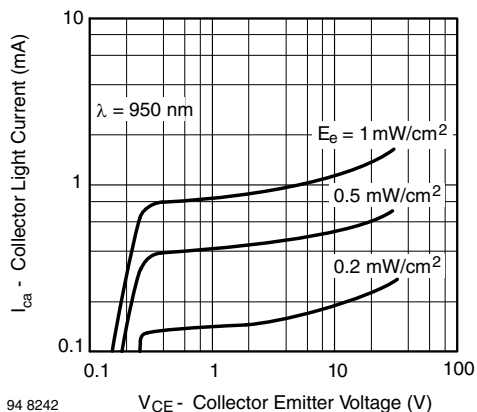


Fig. 4 - Collector Light Current vs. Collector Emitter Voltage

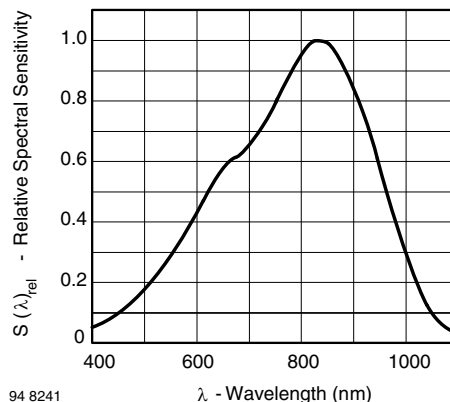


Fig. 7 - Relative Spectral Sensitivity vs. Wavelength

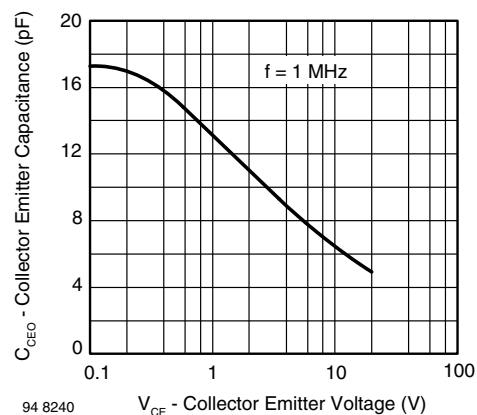


Fig. 5 - Collector Emitter Capacitance vs. Collector Emitter Voltage

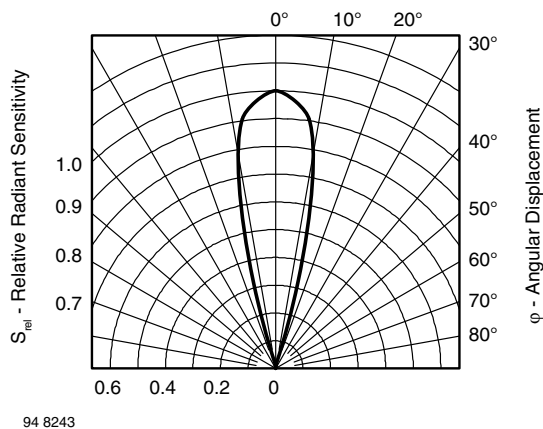
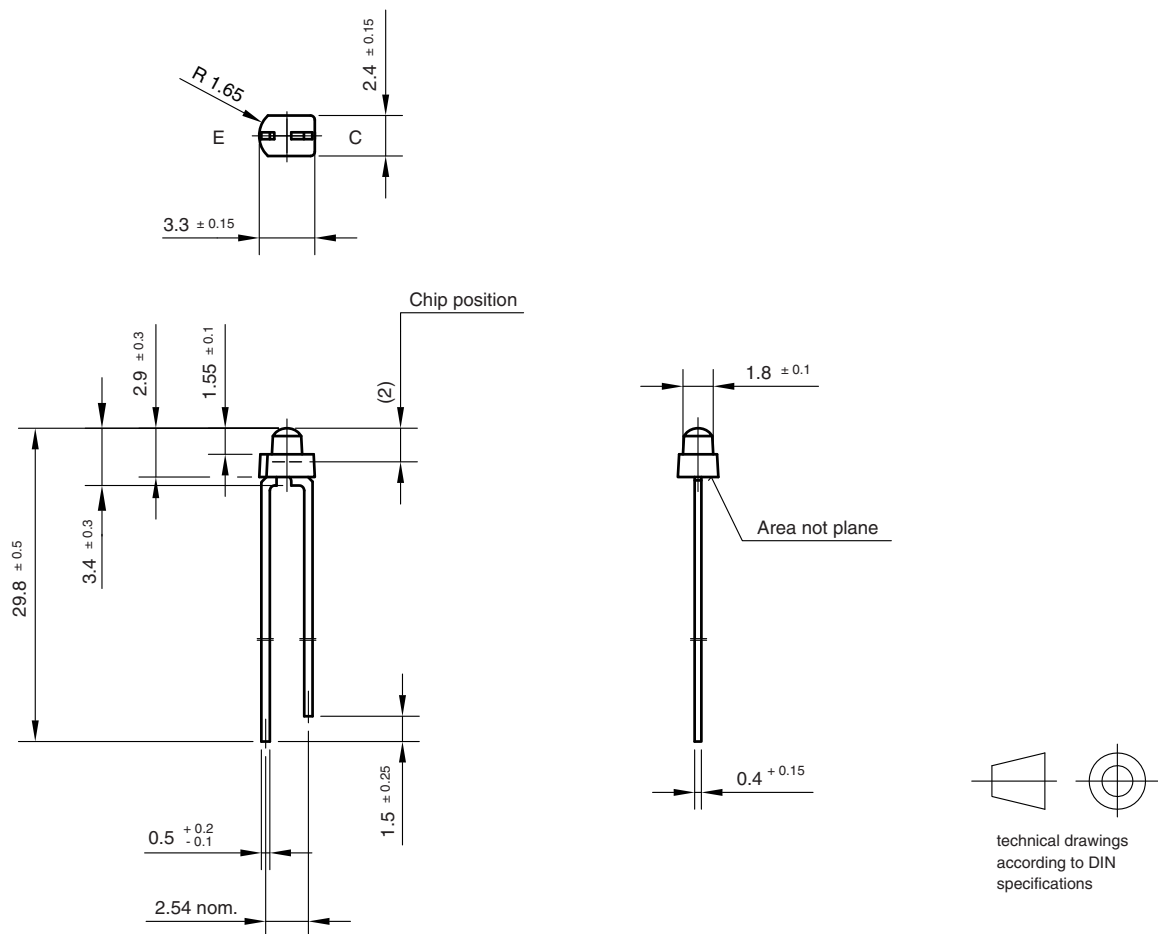


Fig. 8 - Relative Radiant Sensitivity vs. Angular Displacement



**PACKAGE DIMENSIONS** in millimeters



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