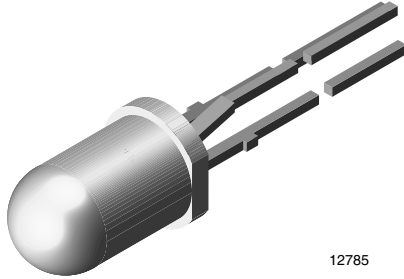


Silicon NPN Phototransistor



12785

FEATURES

- Package type: leaded
- Package form: T-1 $\frac{3}{4}$
- Dimensions (in mm): \varnothing 5
- High photo sensitivity
- High radiant sensitivity
- Suitable for visible and near infrared radiation
- Fast response times
- Angle of half sensitivity: $\varphi = \pm 15^\circ$
- Base terminal connected
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912



DESCRIPTION

BPV11 is a silicon NPN phototransistor with high radiant sensitivity in clear, T-1 $\frac{3}{4}$ plastic package with base terminal. It is sensitive to visible and near infrared radiation.

APPLICATIONS

- Detector for industrial electronic circuitry, measurement and control

PRODUCT SUMMARY

| COMPONENT | I_{ca} (mA) | φ (deg) | $\lambda_{0.1}$ (nm) |
|-----------|---------------|-----------------|----------------------|
| BPV11 | 10 | ± 15 | 450 to 1080 |

Note

- Test condition see table "Basic Characteristics"

ORDERING INFORMATION

| ORDERING CODE | PACKAGING | REMARKS | PACKAGE FORM |
|---------------|-----------|------------------------------|-------------------|
| BPV11 | Bulk | MOQ: 4000 pcs, 4000 pcs/bulk | T-1 $\frac{3}{4}$ |

Note

- MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25^\circ\text{C}$, unless otherwise specified)

| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT |
|-------------------------------------|--|------------|---------------|------------------|
| Collector base voltage | | V_{CBO} | 80 | V |
| Collector emitter voltage | | V_{CEO} | 70 | V |
| Emitter base voltage | | V_{EBO} | 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 | $T_{amb} \leq 47^\circ\text{C}$ | 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 | $t \leq 5$ s, 2 mm from body | T_{sd} | 260 | $^\circ\text{C}$ |
| Thermal resistance junction/ambient | Connected with Cu wire, 0.14 mm ² | R_{thJA} | 350 | K/W |

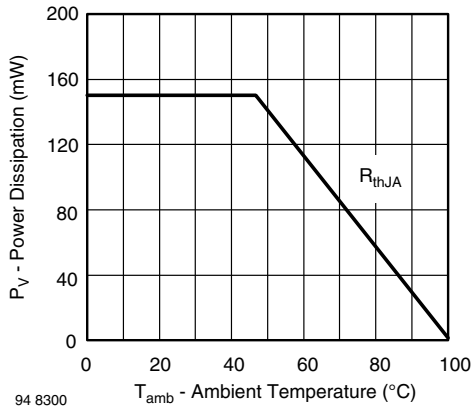


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

| 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 | $V_{CE} = 10\text{ V}, E = 0$ | I_{CEO} | | 1 | 50 | nA |
| DC current gain | $V_{CE} = 5\text{ V}, I_C = 5\text{ mA}, E = 0$ | h_{FE} | | 450 | | |
| Collector emitter capacitance | $V_{CE} = 0\text{ V}, f = 1\text{ MHz}, E = 0$ | C_{CEO} | | 15 | | pF |
| Collector base capacitance | $V_{BE} = 0\text{ V}, f = 1\text{ MHz}, E = 0$ | C_{CBO} | | 19 | | pF |
| Collector light current | $E_e = 1\text{ mW/cm}^2, \lambda = 950\text{ nm}, V_{CE} = 5\text{ V}$ | I_{ca} | 3 | 10 | | mA |
| Angle of half sensitivity | | φ | | ± 15 | | deg |
| Wavelength of peak sensitivity | | λ_p | | 850 | | nm |
| Range of spectral bandwidth | | $\lambda_{0.1}$ | | 450 to 1080 | | nm |
| Collector emitter saturation voltage | $E_e = 1\text{ mW/cm}^2, \lambda = 950\text{ nm}, I_C = 1\text{ mA}$ | V_{CEsat} | | 130 | 300 | mV |
| Turn-on time | $V_S = 5\text{ V}, I_C = 5\text{ mA}, R_L = 100\text{ }\Omega$ | t_{on} | | 6 | | μs |
| Turn-off time | $V_S = 5\text{ V}, I_C = 5\text{ mA}, R_L = 100\text{ }\Omega$ | t_{off} | | 5 | | μs |
| Cut-off frequency | $V_S = 5\text{ V}, I_C = 5\text{ mA}, R_L = 100\text{ }\Omega$ | f_c | | 110 | | kHz |

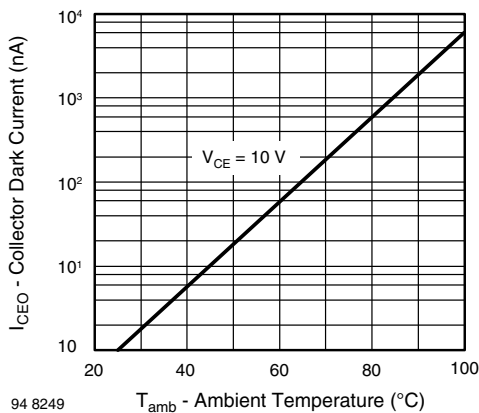
BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)


Fig. 2 - Collector Dark Current vs. Ambient Temperature

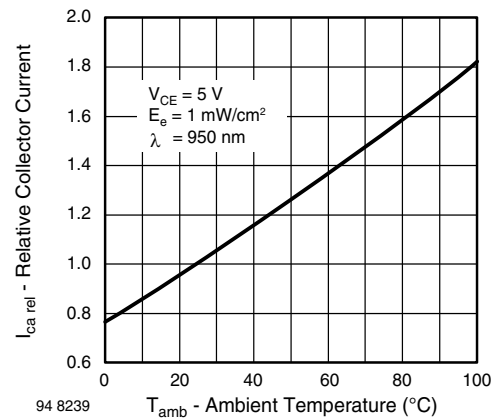


Fig. 3 - Relative Collector Current vs. Ambient Temperature

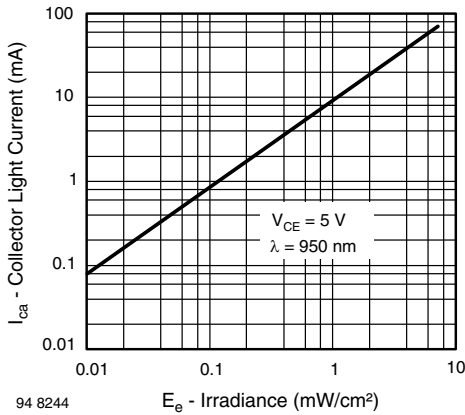


Fig. 4 - Collector Light Current vs. Irradiance

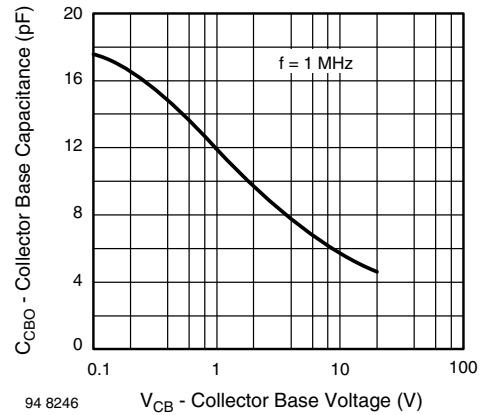


Fig. 7 - Collector Base Capacitance vs. Collector Base Voltage

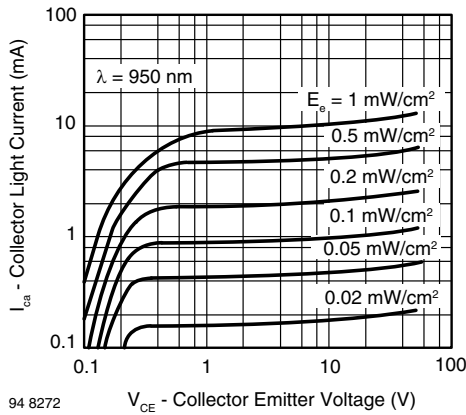


Fig. 5 - Collector Light Current vs. Collector Emitter Voltage

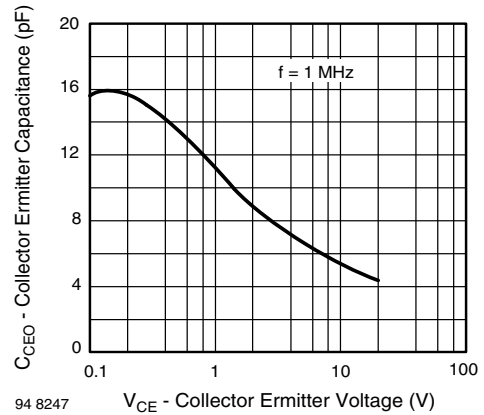


Fig. 8 - Collector Emitter Capacitance vs. Collector Emitter Voltage

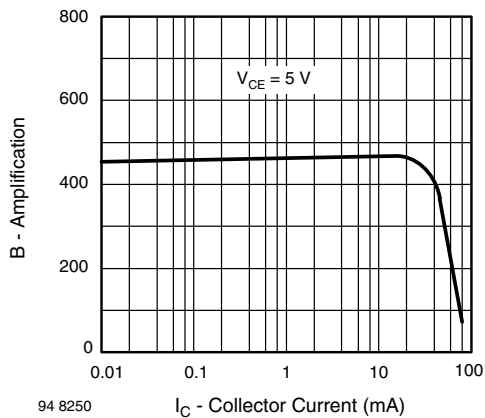


Fig. 6 - Amplification vs. Collector Current

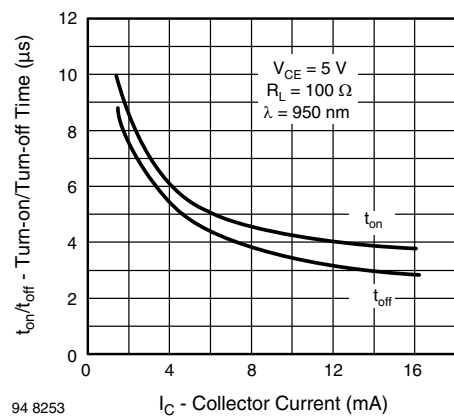


Fig. 9 - Turn-on/Turn-off Time vs. Collector Current

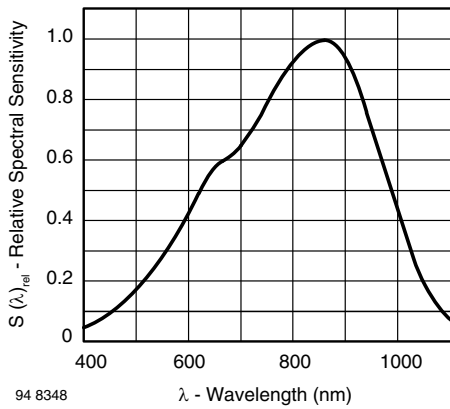


Fig. 10 - Relative Spectral Sensitivity vs. Wavelength

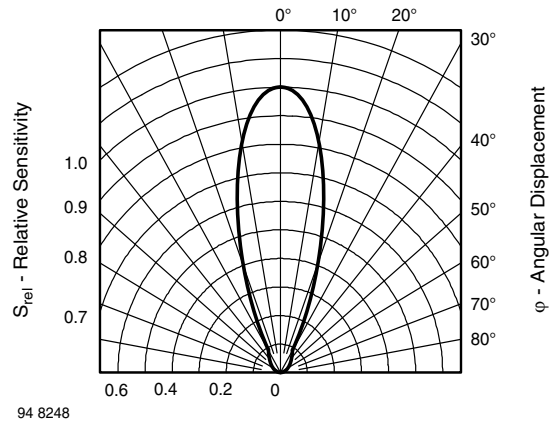
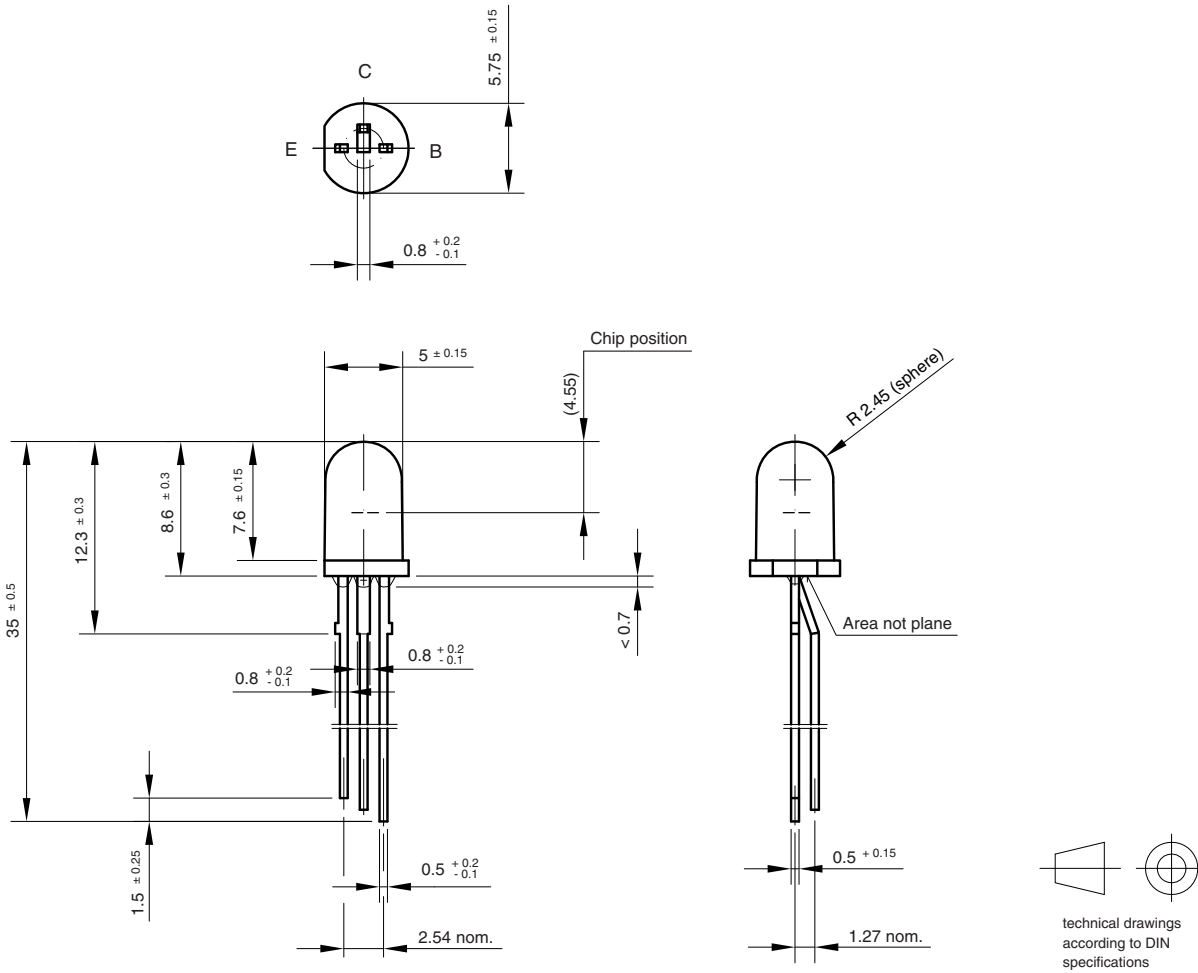


Fig. 11 - Relative Radiant Sensitivity vs. Angular Displacement

PACKAGE DIMENSIONS in millimeters



Drawing-No.: 6.544-5188.01-4

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