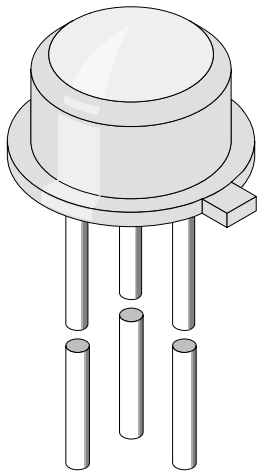
# BPX99R

## Silicon Darlington Phototransistor

### Description

BPX99R is an extra high sensitive monolithic silicon epitaxial planar Darlington phototransistor in a hermetically sealed low profile TO–46 metal case.
The solid metal base allows the user to mount the device on a heatsink and take advantage of the high current capability (500 mA). A glass lens provides a viewing angle of ± 12˚ and makes the device insensible to ambient straylight.
A base terminal is available to enable biasing and sensitivity control.



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### Features

- Hermetically sealed case
- Angle of half sensitivity φ = ± 12˚
- Base terminal available
- Collector light current up to 500 mA
- Extra high photo sensitivity
- Suitable for visible and near infrared radiation

### Applications

Direct driving of relays, magnetic valves, small motors etc.

### Absolute Maximum Ratings

$T_{amb}$ = 25°C

| Parameter | Test Conditions | Symbol | Value | Unit |
|---|---|---|---|---|
| Collector Emitter Voltage | | $V_{CEO}$ | 40 | V |
| Emitter Base Voltage | | $V_{EBO}$ | 10 | V |
| Collector Current | | $I_C$ | 0.5 | A |
| Peak Collector Current | $t_p/T$ = 0.05, $t_p$ ≦ 10 ms | $I_{CM}$ | 1 | A |
| Total Power Dissipation | $T_{amb}$ ≦ 25 ˚C | $P_{tot}$ | 0.33 | W |
| Total Power Dissipation | $T_{case}$ ≦ 45 ˚C | $P_{tot}$ | 1.6 | W |
| Junction Temperature | | $T_j$ | 125 | ˚C |
| Operating Temperature Range | | $T_{amb}$ | –55...+125 | ˚C |
| Thermal Resistance Junction/Ambient | | $R_{thJA}$ | 300 | K/W |
| Thermal Resistance Junction/Case | | $R_{thJC}$ | 50 | K/W |

## Basic Characteristics

$T_{amb}$ = 25°C

| Parameter | Test Conditions | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Collector Emitter Breakdown Voltage | $I_C$ = 1 mA | $V_{(BR)CEO}$ | 40 | | | V |
| Collector Dark Current | $V_{CE}$ = 20 V, E = 0 | $I_{CEO}$ | | 10 | 200 | nA |
| Collector Light Current | $E_e$=0.3 mW/cm$^2$, λ=950nm, $V_{CE}$=5V | $I_{ca}$ | 4 | 15 | | mA |
| Angle of Half Sensitivity | | φ | | ±12 | | deg |
| Wavelength of Peak Sensitivity | | $\lambda_p$ | | 800 | | nm |
| Range of Spectral Bandwidth | | $\lambda_{0.5}$ | | 590...950 | | nm |
| Collector Emitter Saturation Voltage | $E_e$=0.3mW/cm$^2$, λ=950nm, $I_C$=0.1mA | $V_{CEsat}$ | | 0.75 | 1 | V |
| Turn–On Time | $V_S$=5V, $I_C$=10mA, $R_L$=100Ω | $t_{on}$ | | 40 | | µs |
| Turn–Off Time | $V_S$=5V, $I_C$=10mA, $R_L$=100Ω | $t_{off}$ | | 50 | | µs |

## Typical Characteristics ($T_{amb}$ = 25°C unless otherwise specified)

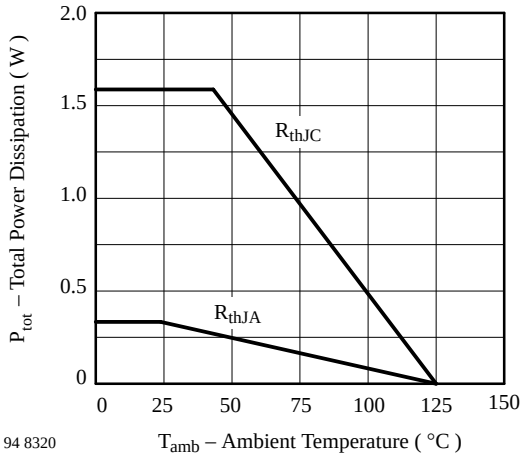



Figure 1. Total Power Dissipation vs. Ambient Temperature

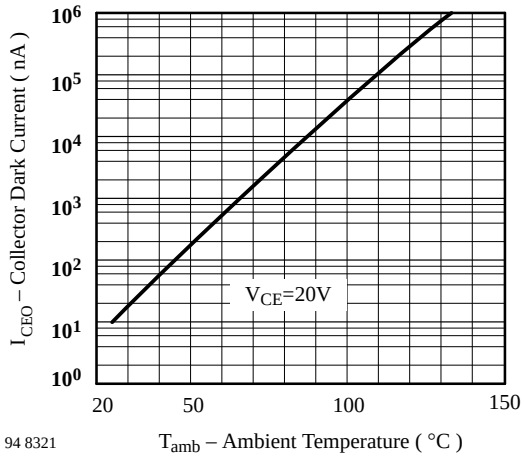



Figure 2. Collector Dark Current vs. Ambient Temperature

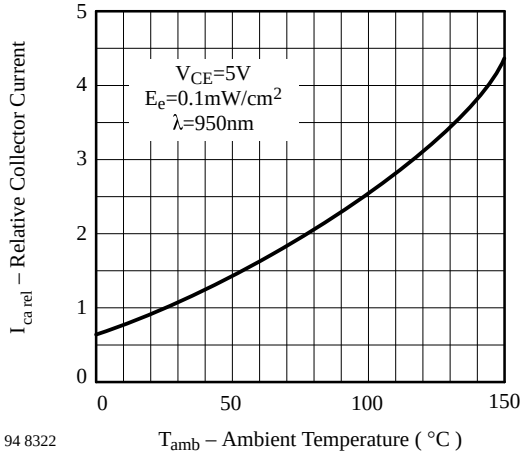



Figure 3. Relative Collector Current vs. Ambient Temperature

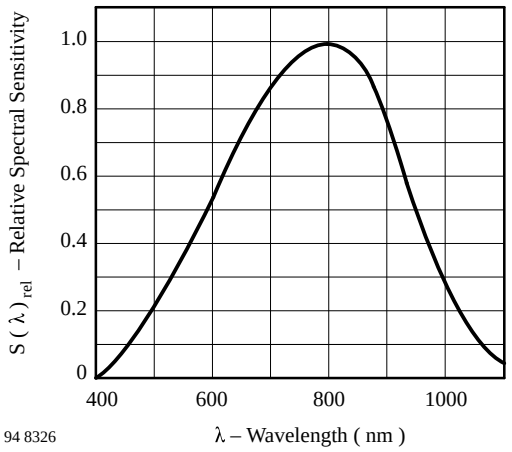



Figure 6. Relative Spectral Sensitivity vs. Wavelength

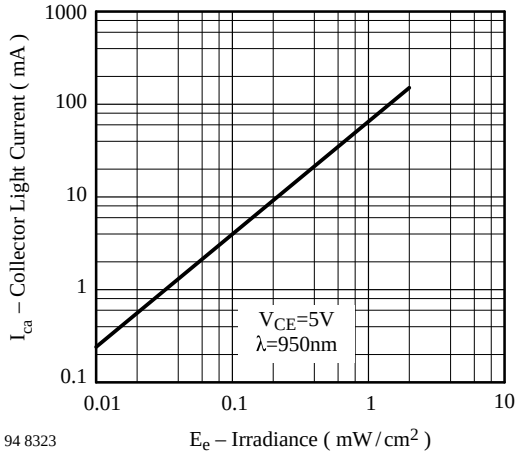



Figure 4. Collector Light Current vs. Irradiance

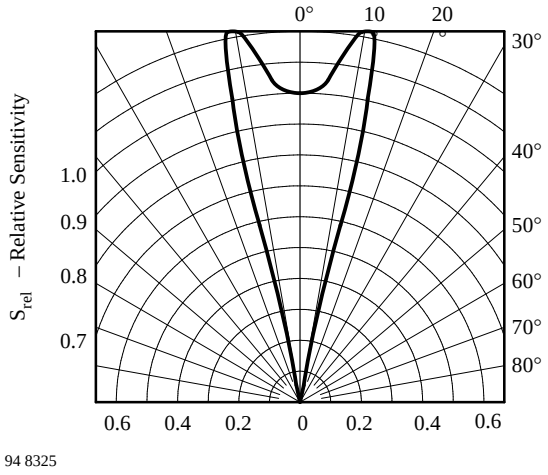



Figure 7. Relative Radiant Sensitivity vs. Angular Displacement

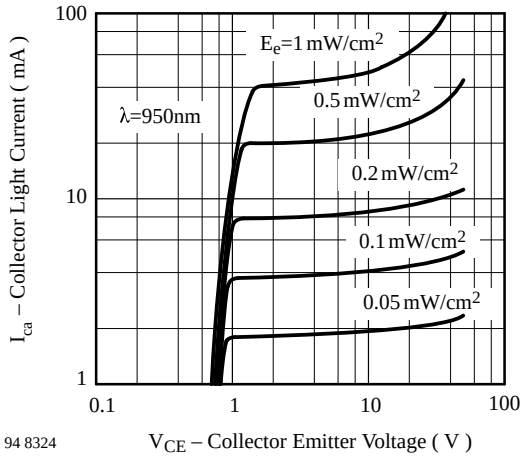
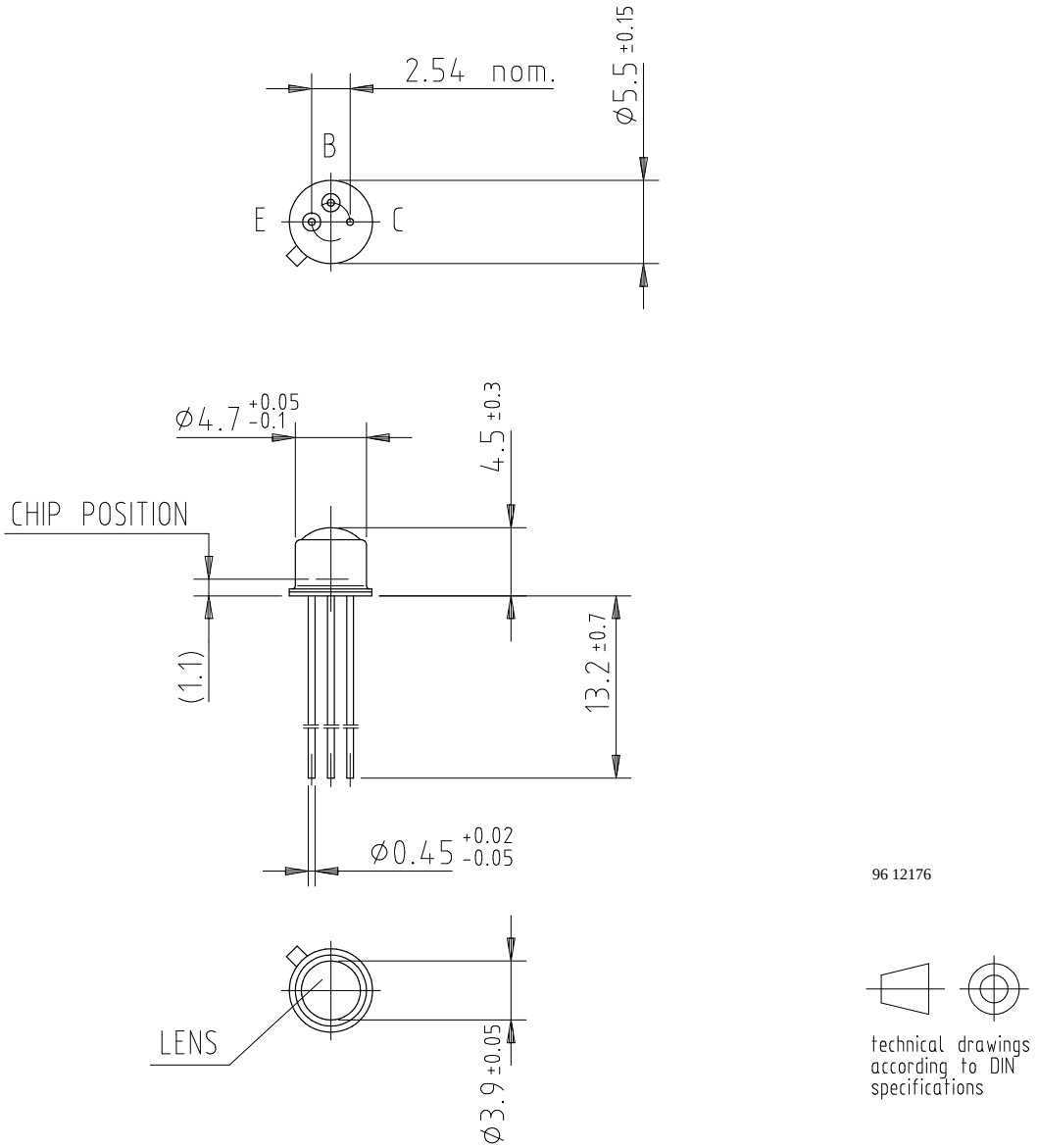



Figure 5. Collector Light Current vs. Collector Emitter Voltage

## Dimensions in mm

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technical drawings
according to DIN
specifications

## Ozone Depleting Substances Policy Statement

It is the policy of **TEMIC TELEFUNKEN microelectronic GmbH** to

1. Meet all present and future national and international statutory requirements.

2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

**TEMIC TELEFUNKEN microelectronic GmbH** semiconductor division has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively

2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA

3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

**TEMIC** can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.



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