

NPN-Silizium-Fototransistor Silicon NPN Phototransistor

BP 103



Wesentliche Merkmale

- Speziell geeignet für Anwendungen im Bereich von 420 nm bis 1130 nm
- Hohe Linearität
- TO-18, Bodenplatte, klares Epoxy-Gießharz, mit Basisanschluß

Anwendungen

- Computer-Blitzlichtgeräte
- Lichtschranken für Gleich- und Wechsellichtbetrieb
- Industrieelektronik
- „Messen/Steuern/Regeln“

Features

- Especially suitable for applications from 420 nm to 1130 nm
- High linearity
- TO-18, base plate, transparent epoxy resin lens, with base connection

Applications

- Computer-controlled flashes
- Photointerrupters
- Industrial electronics
- For control and drive circuits

| Typ Type | Bestellnummer Ordering Code |
|-------------|--------------------------------|
| BP 103 | Q62702-P75 |
| BP 103-3 | Q62702-P79-S2 |
| BP 103-3/4 | Q62702-P3577 |
| BP 103-4 | Q62702-P79-S4 |

Grenzwerte
Maximum Ratings

| Bezeichnung Parameter | Symbol Symbol | Wert Value | Einheit Unit |
|---|-------------------|---------------|-----------------|
| Betriebs- und Lagertemperatur Operating and storage temperature range | $T_{op}; T_{stg}$ | - 40 ... + 80 | °C |
| Löttemperatur bei Tauchlötung Lötstelle ≥ 2 mm vom Gehäuse, Lötzeit $t \leq 5$ s Dip soldering temperature, ≥ 2 mm distance from case bottom $t \leq 5$ s | T_S | 260 | °C |
| Löttemperatur bei Kolbenlötung Lötstelle ≥ 2 mm vom Gehäuse, Lötzeit $t \leq 3$ s Iron soldering temperature, ≥ 2 mm distance from case bottom $t \leq 3$ s | T_S | 300 | °C |
| Kollektor-Emitterspannung Collector-emitter voltage | V_{CE} | 50 | V |
| Kollektorstrom Collector current | I_C | 100 | mA |
| Kollektorspitzenstrom, $\tau < 10 \mu\text{s}$ Collector surge current | I_{CS} | 200 | mA |
| Emitter-Basisspannung Emitter-base voltage | V_{EB} | 7 | V |
| Verlustleistung, $T_A = 25 \text{ °C}$ Total power dissipation | P_{tot} | 150 | mW |
| Wärmewiderstand Thermal resistance | R_{thJA} | 500 | K/W |

Kennwerte ($T_A = 25\text{ °C}$, $\lambda = 950\text{ nm}$)

Characteristics

| Bezeichnung Parameter | Symbol Symbol | Wert Value | Einheit Unit |
|--|---|------------------|--------------------------------|
| Wellenlänge der max. Fotoempfindlichkeit Wavelength of max. sensitivity | $\lambda_{S\text{ max}}$ | 850 | nm |
| Spektraler Bereich der Fotoempfindlichkeit $S = 10\%$ von S_{max} Spectral range of sensitivity $S = 10\%$ of S_{max} | λ | 420 ... 1130 | nm |
| Bestrahlungsempfindliche Fläche Radiant sensitive area | A | 0.12 | mm ² |
| Abmessungen der Chipfläche Dimensions of chip area | $L \times B$ $L \times W$ | 0.5×0.5 | mm \times mm |
| Abstand Chipoberfläche zu Gehäuseoberfläche Distance chip front to case surface | H | 0.2 ... 0.8 | mm |
| Halbwinkel Half angle | φ | ± 55 | Grad deg. |
| Fotostrom der Kollektor-Basis-Fotodiode Photocurrent of collector-base photodiode $E_e = 0.5\text{ mW/cm}^2$, $V_{\text{CB}} = 5\text{ V}$ $E_v = 1000\text{ lx}$, Normlicht/standard light a $V_{\text{CB}} = 5\text{ V}$ | I_{PCB} I_{PCB} | 0.9 2.7 | μA μA |
| Kapazität Capacitance $V_{\text{CE}} = 0\text{ V}$, $f = 1\text{ MHz}$, $E = 0$ $V_{\text{CB}} = 0\text{ V}$, $f = 1\text{ MHz}$, $E = 0$ $V_{\text{EB}} = 0\text{ V}$, $f = 1\text{ MHz}$, $E = 0$ | C_{CE} C_{CB} C_{EB} | 8 11 19 | pF pF pF |
| Dunkelstrom Dark current $V_{\text{CE}} = 35\text{ V}$, $E = 0$ | I_{CEO} | 5 (≤ 100) | nA |

Die Fototransistoren werden nach ihrer Fotoempfindlichkeit gruppiert und mit arabischen Ziffern gekennzeichnet.

The phototransistors are grouped according to their spectral sensitivity and distinguished by arabian figures.

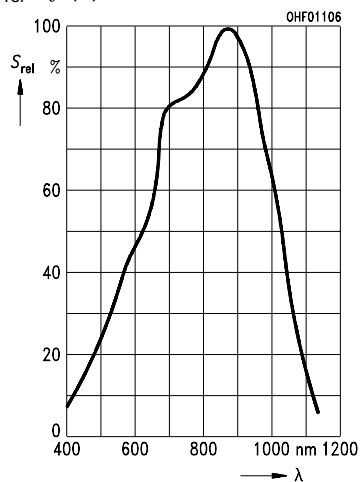
| Bezeichnung Parameter | Symbol Symbol | Wert Value | | | | Einheit Unit |
|--|---------------------------|---------------|-------------|-------------|------------|-----------------|
| | | -2 | -3 | -4 | -5 | |
| Fotostrom, $\lambda = 950 \text{ nm}$ Photocurrent $E_e = 0.5 \text{ mW/cm}^2$, $V_{CE} = 5 \text{ V}$ $E_v = 1000 \text{ lx}$ Normlicht/standard light A $V_{CE} = 5 \text{ V}$ | I_{PCE} | 80 ... 160 | 125 ... 250 | 200 ... 400 | ≥ 320 | μA |
| | I_{PCE} | 0.38 | 0.6 | 0.95 | 1.4 | mA |
| Anstiegszeit/Abfallzeit Rise and fall time $I_C = 1 \text{ mA}$, $V_{CC} = 5 \text{ V}$, $R_L = 1 \text{ k}\Omega$ | t_r, t_f | 5 | 7 | 9 | 12 | μs |
| Kollektor-Emitter-Sättigungsspannung Collector-emitter saturation voltage $I_C = I_{PCEmin}^{1)} \times 0.3$ $E_e = 0.5 \text{ mW/cm}^2$ | V_{CEsat} | 150 | 150 | 150 | 150 | mV |
| Stromverstärkung Current gain $E_e = 0.5 \text{ mW/cm}^2$, $V_{CE} = 5 \text{ V}$ | $\frac{I_{PCE}}{I_{PCB}}$ | 140 | 210 | 340 | 530 | – |

1) I_{PCEmin} ist der minimale Fotostrom der jeweiligen Gruppe.

1) I_{PCEmin} is the min. photocurrent of the specified group.

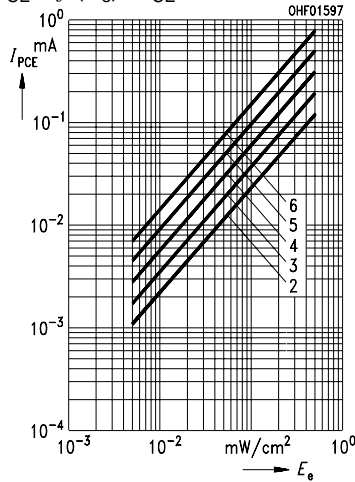
Relative Spectral Sensitivity

$S_{rel} = f(\lambda)$



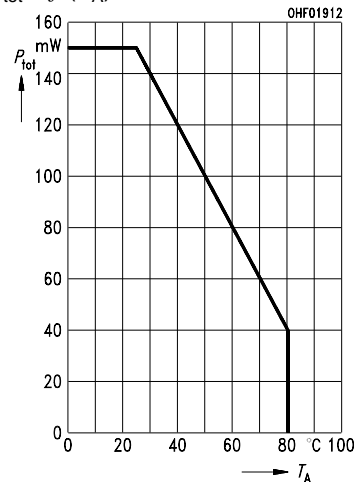
Photocurrent

$I_{PCE} = f(E_e), V_{CE} = 5 V$



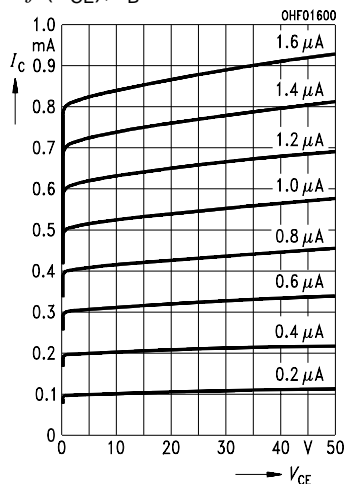
Total Power Dissipation

$P_{tot} = f(T_A)$



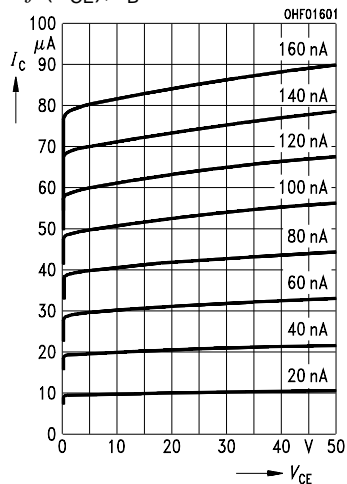
Output Characteristics

$I_C = f(V_{CE}), I_B = \text{Parameter}$



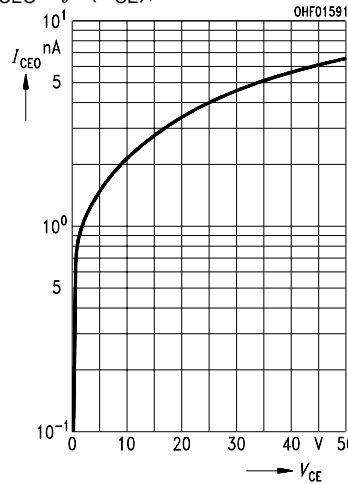
Output Characteristics

$I_C = f(V_{CE}), I_B = \text{Parameter}$



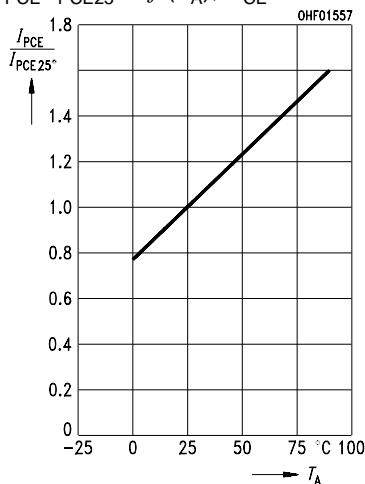
Dark Current

$I_{CEO} = f(V_{CE}), E = 0$

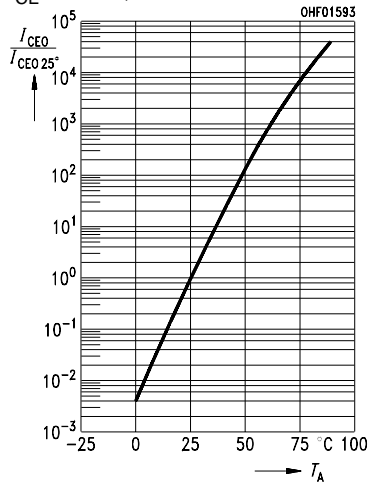


Photocurrent

$I_{PCE}/I_{PCE25^\circ} = f(T_A), V_{CE} = 5 V$

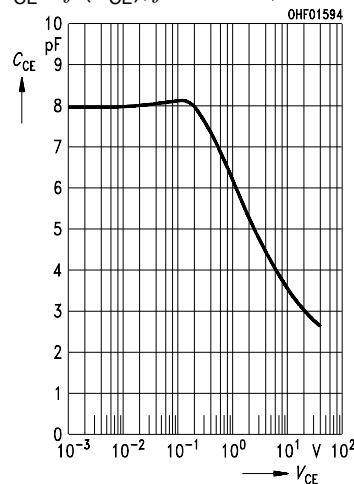


Dark Current $I_{CEO}/I_{CEO25^\circ} = f(T_A), V_{CE} = 25 V, E = 0$



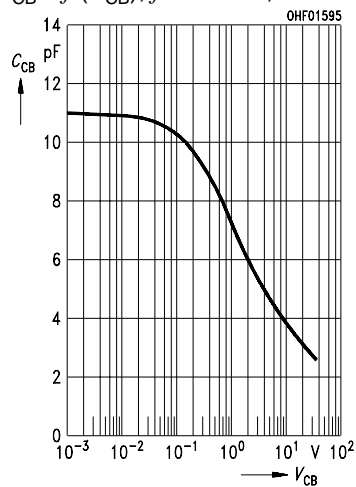
Collector-Emitter Capacitance

$C_{CE} = f(V_{CE}), f = 1 \text{ MHz}, E = 0$



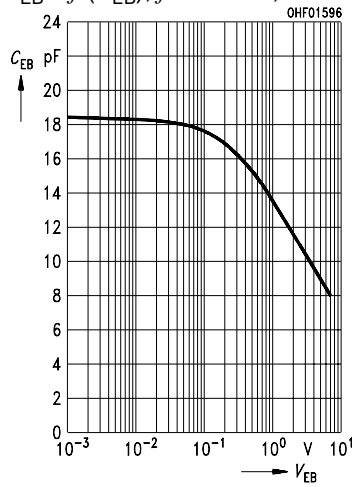
Collector-Emitter Capacitance

$C_{CB} = f(V_{CB}), f = 1 \text{ MHz}, E = 0$



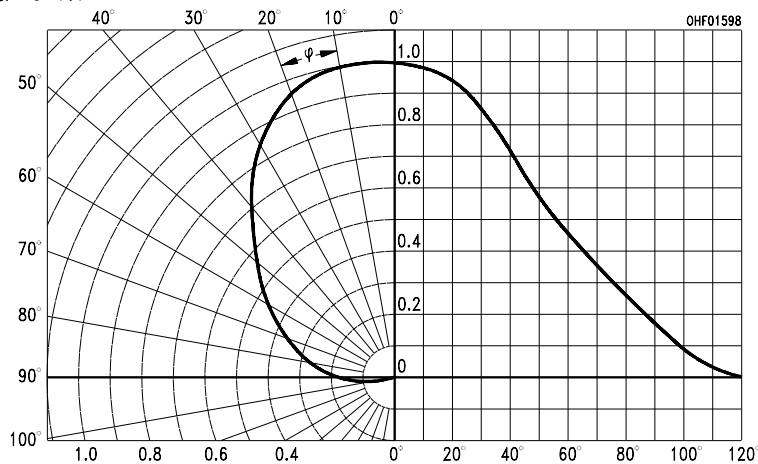
Emitter-Base Capacitance

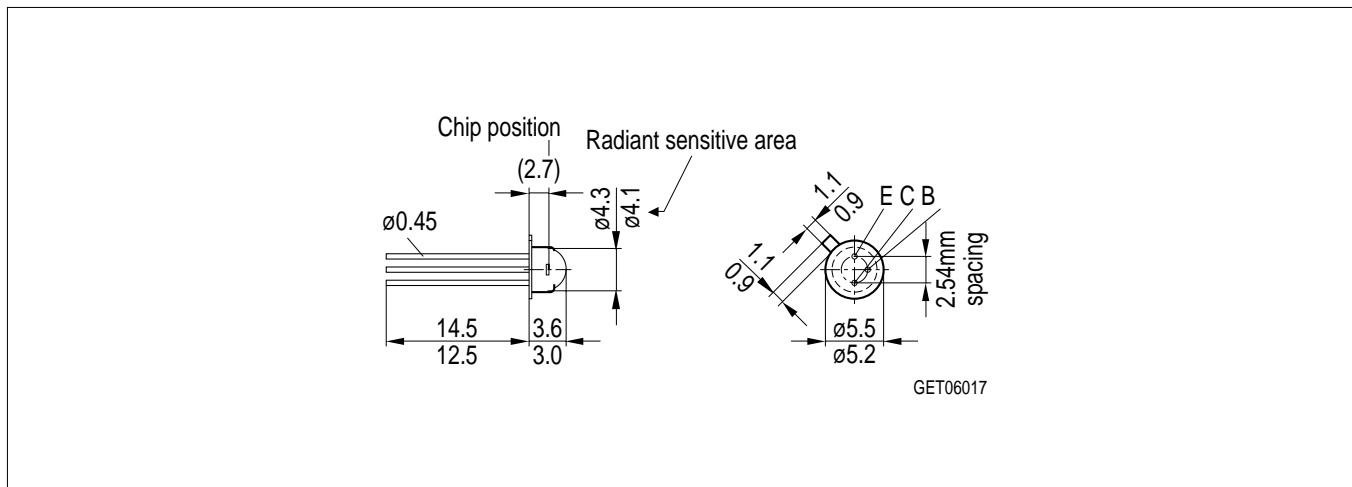
$C_{EB} = f(V_{EB}), f = 1 \text{ MHz}, E = 0$



Directional Characteristics

$S_{rel} = f(\varphi)$



**Maßzeichnung
Package Outlines**

Maße in mm, wenn nicht anders angegeben / Dimensions in mm, unless otherwise specified.