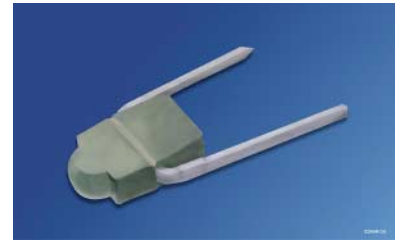


**Mini-NPN-Silizium-Fototransistor**  
**Mini-Silicon NPN Phototransistor**  
**Lead (Pb) Free Product - RoHS Compliant**

**SFH 305**



**Wesentliche Merkmale**

- Speziell geeignet für Anwendungen im Bereich von 460 nm bis 1060 nm
- Hohe Linearität
- Mini-Bauform
- Gruppiert lieferbar

**Features**

- Especially suitable for applications from 460 nm to 1060 nm
- High linearity
- Mini-package
- Available in groups

**Anwendungen**

- Miniaturlichtschranken
- Industrieelektronik
- „Messen/Steuern/Regeln“

**Applications**

- Miniature photointerrupters
- Industrial electronics
- For control and drive circuits

| Typ<br>Type | Bestellnummer<br>Ordering Code | Fotostrom , $E_e = 0.5 \text{ mW/cm}^2$ , $\lambda = 950 \text{ nm}$ , $V_{CE} = 5 \text{ V}$<br>Photocurrent<br>$I_{PCE}$ (mA) |
|-------------|--------------------------------|---|
| SFH 305     | Q62702P0836                    | 0.25...1.25   |
| SFH 305-2/3 | Q62702P3589                    | 0.25...0.8  |

**Grenzwerte**  
**Maximum Ratings**

| Bezeichnung<br>Parameter   | Symbol<br>Symbol  | Wert<br>Value | Einheit<br>Unit |
|--|-------------------|---------------|-----------------|
| Betriebs- und Lagertemperatur<br>Operating and storage temperature range | $T_{op}; T_{stg}$ | - 40 ...+ 80  | °C              |
| Kollektor-Emitterspannung<br>Collector-emitter voltage                   | $V_{CE}$          | 35            | V               |
| Kollektorstrom<br>Collector current                                      | $I_C$             | 50            | mA              |
| Kollektorspitzenstrom, $\tau < 10 \mu s$<br>Collector surge current      | $I_{CS}$          | 200           | mA              |
| Verlustleistung, $T_A = 25 \text{ }^\circ\text{C}$<br>Power dissipation  | $P_{tot}$         | 70            | mW              |
| Wärmewiderstand<br>Thermal resistance                                    | $R_{thJA}$        | 950           | K/W             |

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

**Characteristics**

| Bezeichnung<br>Parameter   | Symbol<br>Symbol             | Wert<br>Value    | Einheit<br>Unit |
|--|------------------------------|------------------|-----------------|
| Wellenlänge der max. Fotoempfindlichkeit<br>Wavelength of max. sensitivity   | $\lambda_{S_{\max}}$         | 850              | nm              |
| Spektraler Bereich der Fotoempfindlichkeit<br>$S = 10\%$ von $S_{\max}$<br>Spectral range of sensitivity<br>$S = 10\%$ of $S_{\max}$ | $\lambda$                    | 450 ...1100      | nm              |
| Bestrahlungsempfindliche Fläche<br>Radiant sensitive area  | $A$                          | 0.11             | mm <sup>2</sup> |
| Abmessungen der Chipfläche<br>Dimensions of chip area  | $L \times B$<br>$L \times W$ | $0.5 \times 0.5$ | mm $\times$ mm  |
| Halbwinkel<br>Half angle   | $\varphi$                    | $\pm 16$         | Grad<br>deg.    |
| Kapazität<br>Capacitance<br>$V_{CE} = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$   | $C_{CE}$                     | 7.5              | pF              |
| Dunkelstrom<br>Dark current<br>$V_{CE} = 20\text{ V}$ , $E = 0$  | $I_{CEO}$                    | 1 ( $\leq 50$ )  | 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.

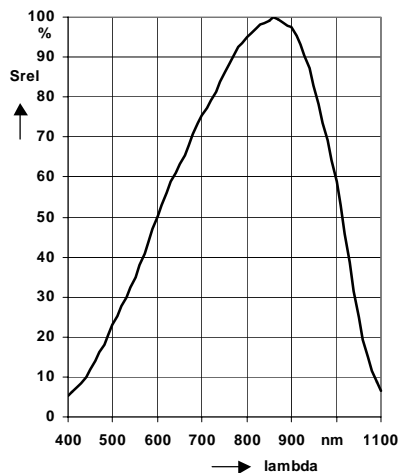
| Bezeichnung<br>Parameter   | Symbol<br>Symbol       | Wert<br>Value    |                 |                   | Einheit<br>Unit |
|--|------------------------|------------------|-----------------|-------------------|-----------------|
|  |                        | -2               | -3              | -4                |                 |
| Fotostrom<br>Photocurrent<br>$E_e = 0.5 \text{ mW/cm}^2$ , $\lambda = 950 \text{ nm}^2$ , $V_{CE} = 5 \text{ V}$<br>$E_v = 1000 \text{ lx}$ , Normlicht/standard light A, $V_{CE} = 5 \text{ V}$ | $I_{PCE}$<br>$I_{PCE}$ | 0.25..0.5<br>1.2 | 0.4..0.8<br>1.9 | 0.63..1.25<br>3.0 | mA<br>mA        |
| Anstiegszeit/Abfallzeit<br>Rise and fall time<br>$I_C = 1 \text{ mA}$ , $V_{CC} = 5 \text{ V}$ , $R_L = 1 \text{ k}\Omega$   | $t_r$ , $t_f$          | 5.5              | 6               | 8                 | $\mu\text{s}$   |
| Kollektor-Emitter-Sättigungsspannung<br>Collector-emitter saturation voltage<br>$I_C = I_{PCEmin}^{1)} \times 0.3$ , $E_e = 0.5 \text{ mW/cm}^2$   | $V_{CEsat}$            | 150              | 150             | 150               | mV              |

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

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

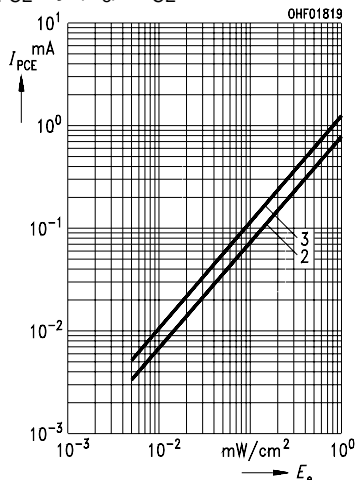
**Relative Spectral Sensitivity**

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



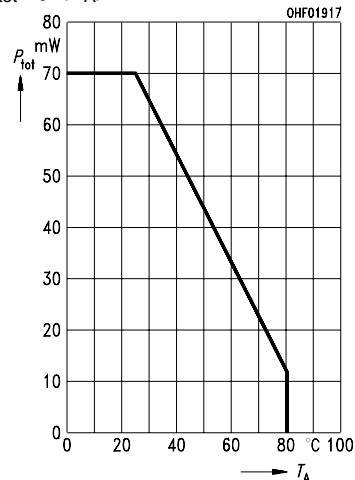
**Photocurrent**

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



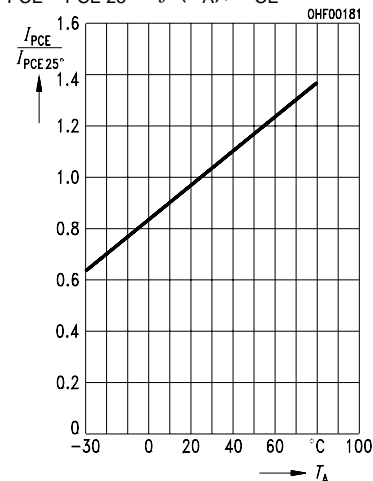
**Total Power Dissipation**

$P_{tot} = f(T_A)$



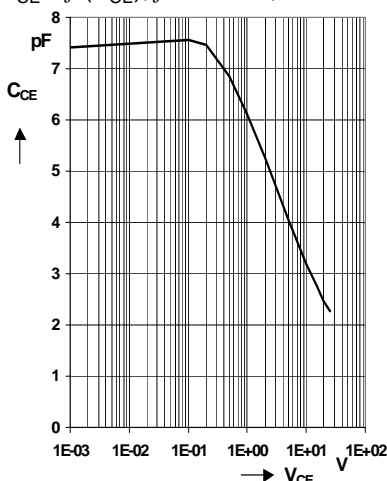
**Photocurrent**

$I_{PCE} / I_{PCE 25^\circ} = f(T_A), V_{CE} = 5 \text{ V}$



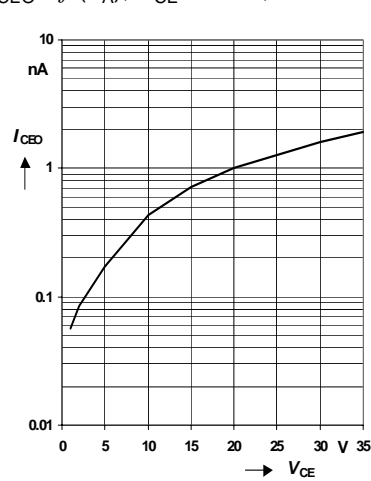
**Collector-Emitter Capacitance**

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



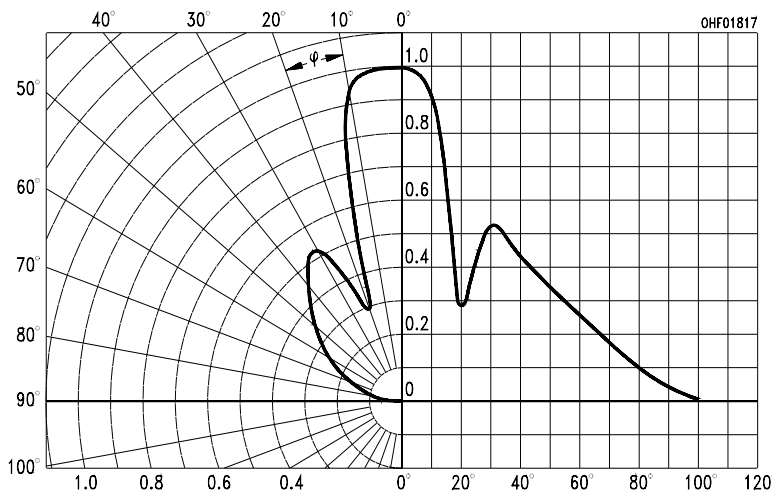
**Dark Current**

$I_{CEO} = f(T_A), V_{CE} = 25 \text{ V}, E = 0$



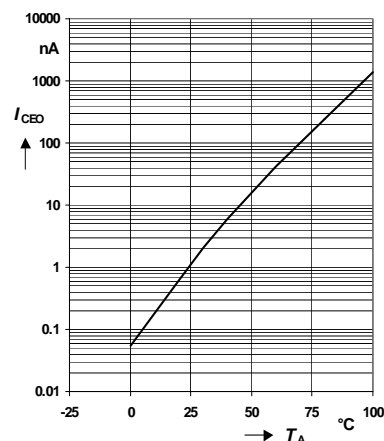
**Directional Characteristics**

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

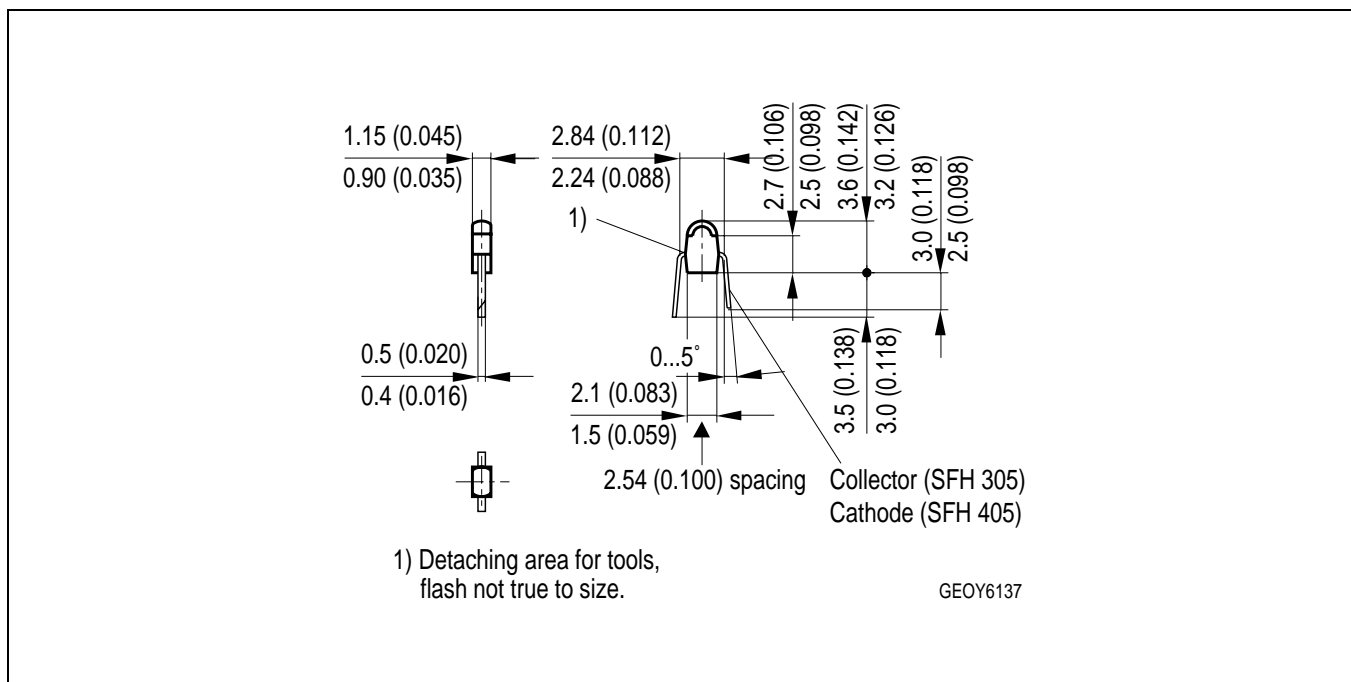


**Dark Current**

$I_{CEO} = f(T_A), V_{CE} = 20 \text{ V}, E = 0$



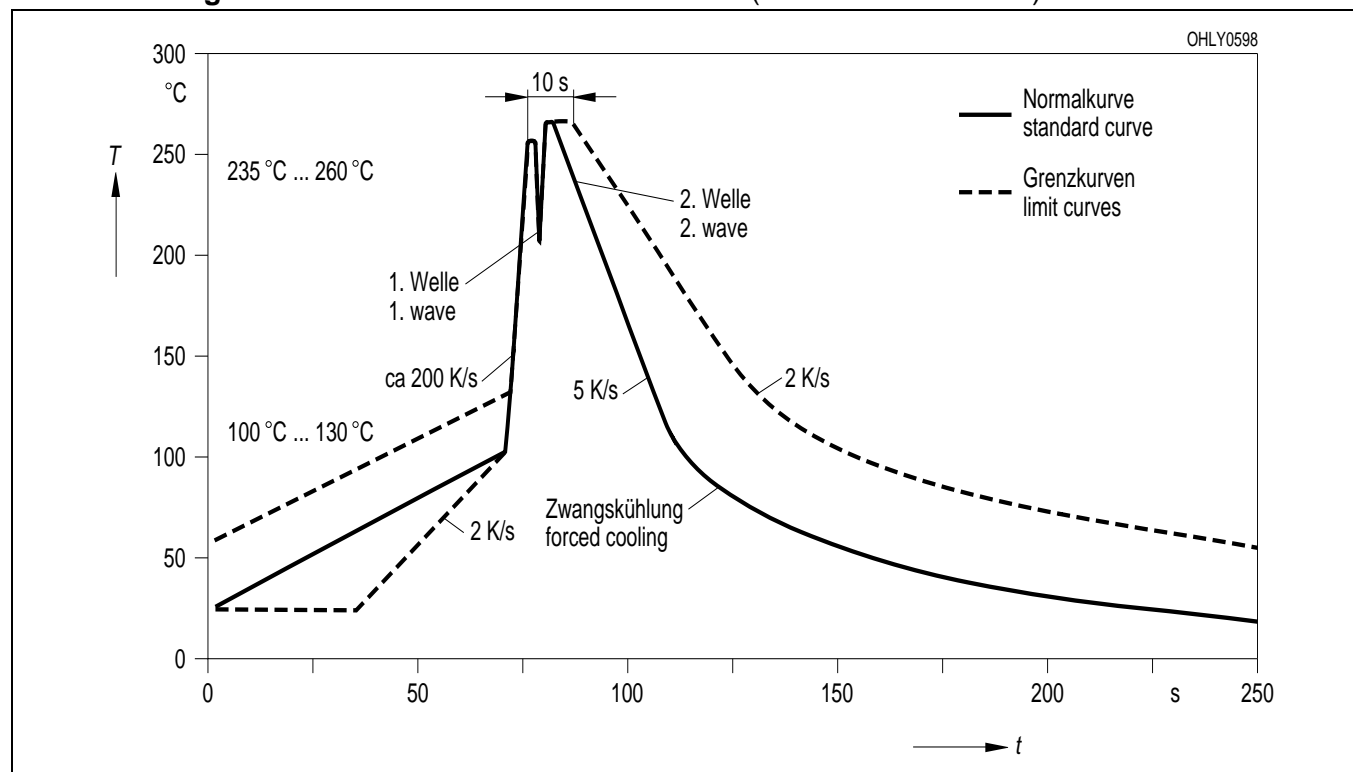
## Maßzeichnung Package Outlines



Maße in mm (inch) / Dimensions in mm (inch).

**Lötbedingungen**  
**Soldering Conditions**  
**Wellenlöten (TTW)**  
**TTW Soldering**

(nach CECC 00802)  
(acc. to CECC 00802)



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<sup>1</sup> A critical component is a component used in a life-support device or system whose failure can reasonably be expected to cause the failure of that life-support device or system, or to affect its safety or effectiveness of that device or system.

<sup>2</sup> Life support devices or systems are intended (a) to be implanted in the human body, or (b) to support and/or maintain and sustain human life. If they fail, it is reasonable to assume that the health of the user may be endangered.

2007-04-18

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