

# NPN-Silizium-Fototransistor

## Silicon NPN Phototransistor

### Lead (Pb) Free Product - RoHS Compliant

#### SFH 314

#### SFH 314 FA



SFH 314



SFH 314 FA

#### Wesentliche Merkmale

- Speziell geeignet für Anwendungen im Bereich von 460 nm bis 1080 nm (SFH 314) und bei 880 nm (SFH 314 FA)
- Hohe Linearität
- 5 mm-Plastikbauform

#### Anwendungen

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

#### Features

- Especially suitable for applications from 460 nm to 1080 nm (SFH 314) and of 880 nm (SFH 314 FA)
- High linearity
- 5 mm plastic package

#### Applications

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

| Typ<br>Type    | Bestellnummer<br>Ordering Code |
|----------------|--------------------------------|
| SFH 314        | Q62702P1668                    |
| SFH 314-2/3    | Q62702P3600                    |
| SFH 314 FA     | Q62702P1675                    |
| SFH 314 FA-2/3 | Q62702P3599                    |

**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 ... + 100 | °C              |
| Kollektor-Emitterspannung<br>Collector-emitter voltage                   | $V_{CE}$          | 70             | V               |
| Kollektorstrom<br>Collector current                                      | $I_C$             | 50             | mA              |
| Kollektorspitzenstrom, $\tau < 10 \mu s$<br>Collector surge current      | $I_{CS}$          | 100            | mA              |
| Emitter-Kollektorspannung<br>Emitter-collector voltage                   | $V_{EC}$          | 7              | V               |
| Verlustleistung, $T_A = 25 \text{ °C}$<br>Total power dissipation        | $P_{tot}$         | 200            | mW              |
| Wärmewiderstand<br>Thermal resistance                                    | $R_{thJA}$        | 375            | 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 |
|--|------------------------------|------------------|------------------|-----------------|
|  |                              | SFH 314          | SFH 314 FA       |                 |
| Wellenlänge der max. Fotoempfindlichkeit<br>Wavelength of max. sensitivity   | $\lambda_{S\max}$            | 850              | 870              | nm              |
| Spektraler Bereich der Fotoempfindlichkeit<br>$S = 10\%$ von $S_{\max}$<br>Spectral range of sensitivity<br>$S = 10\%$ of $S_{\max}$ | $\lambda$                    | 460 ... 1080     | 740 ... 1080     | nm              |
| Bestrahlungsempfindliche Fläche<br>Radiant sensitive area  | $A$                          | 0.55             | 0.55             | mm <sup>2</sup> |
| Abmessungen der Chipfläche<br>Dimensions of chip area  | $L \times B$<br>$L \times W$ | 1 × 1            | 1 × 1            | mm × mm         |
| Halbwinkel<br>Half angle   | $\varphi$                    | ± 40             | ± 40             | Grad<br>deg.    |
| Kapazität, $V_{CE} = 5\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$<br>Capacitance   | $C_{CE}$                     | 10               | 10               | pF              |
| Dunkelstrom<br>Dark current<br>$V_{CE} = 10\text{ V}$ , $E = 0$  | $I_{CEO}$                    | 3 ( $\leq 200$ ) | 3 ( $\leq 200$ ) | 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.

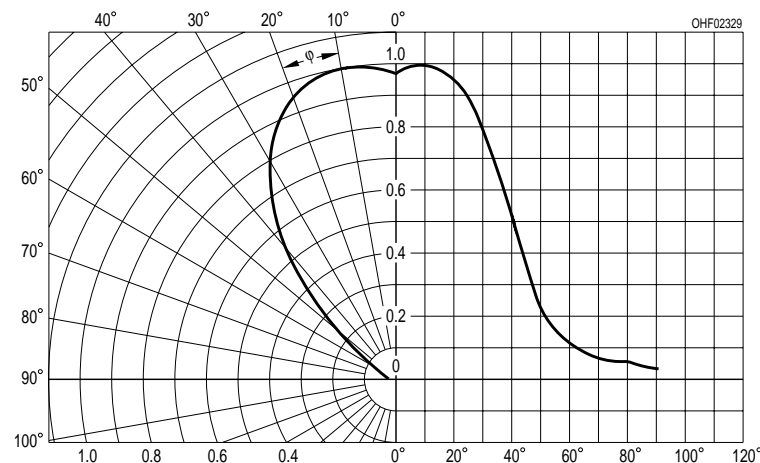
| Bezeichnung<br>Parameter  | Symbol<br>Symbol | Wert<br>Value |         |             |            | Einheit<br>Unit |
|---|------------------|---------------|---------|-------------|------------|-----------------|
|   |                  | -1            | -2      | -3          | -4         |                 |
| Fotostrom, $\lambda = 950 \text{ nm}$<br>Photocurrent<br>$E_e = 0.5 \text{ mW/cm}^2, V_{CE} = 5 \text{ V}$  | $I_{PCE}$        | 0.63 ... 1.25 | 1 ... 2 | 1.6 ... 3.2 | $\geq 2.5$ | mA              |
| <b>SFH 314:</b><br>$E_v = 1000 \text{ lx}$ , Normlicht/<br>standard light A, $V_{CE} = 5 \text{ V}$   | $I_{PCE}$        | 3.4           | 5.4     | 8.6         | 13.5       | mA              |
| Anstiegszeit/Abfallzeit<br>Rise and fall time<br>$I_C = 1 \text{ mA}, V_{CC} = 5 \text{ V}, R_L = 1 \text{ k}\Omega$                                      | $t_r, t_f$       | 8             | 10      | 12          | 14         | $\mu\text{s}$   |
| Kollektor-Emitter-<br>Sättigungsspannung<br>Collector-emitter saturation<br>voltage<br>$I_C = I_{PCEmin}^{1)} \times 0.3,$<br>$E_e = 0.5 \text{ mW/cm}^2$ | $V_{CEsat}$      | 150           | 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.

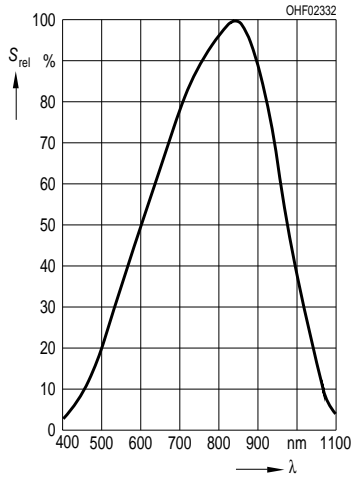
### Directional Characteristics

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

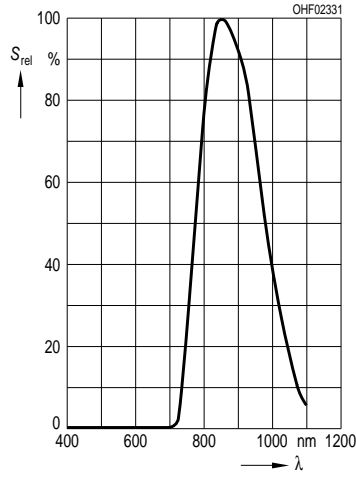


$T_A = 25\text{ }^\circ\text{C}$ ,  $\lambda = 950\text{ nm}$

**Relative Spectral Sensitivity, SFH 314**  $S_{rel} = f(\lambda)$

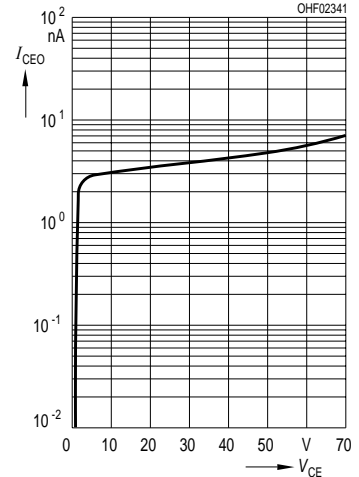


**Relative Spectral Sensitivity, SFH 314 FA**  $S_{rel} = f(\lambda)$

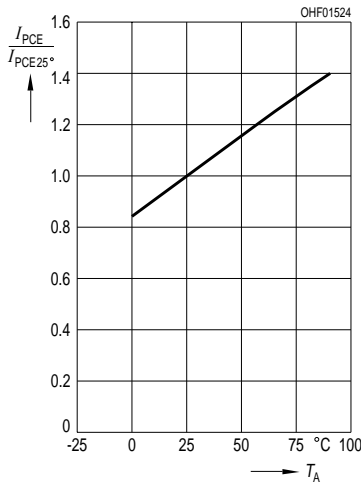


**Dark Current**

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

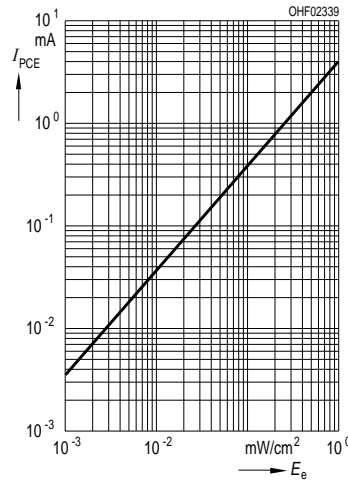


**Photocurrent**  $I_{PCE} = f(T_A)$ ,  $V_{CE} = 5\text{ V}$ , normalized to  $25\text{ }^\circ\text{C}$



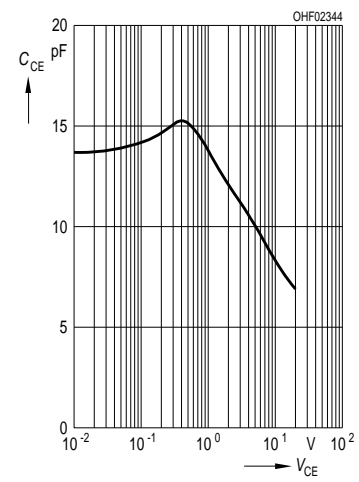
**Photocurrent**

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



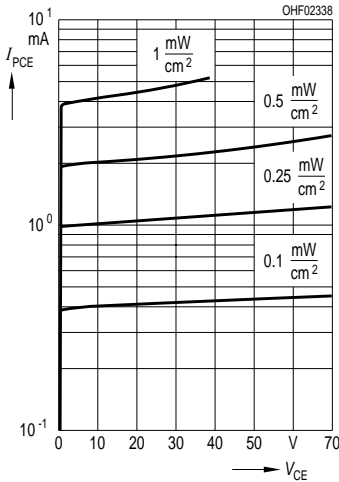
**Collector-Emitter Capacitance**

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



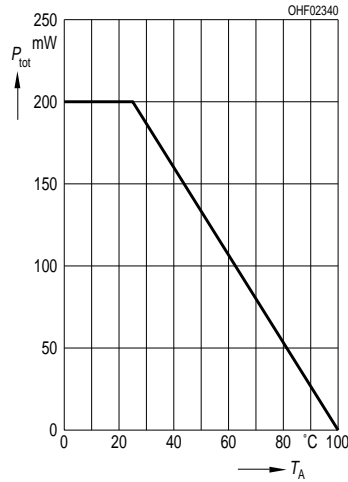
**Photocurrent**

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



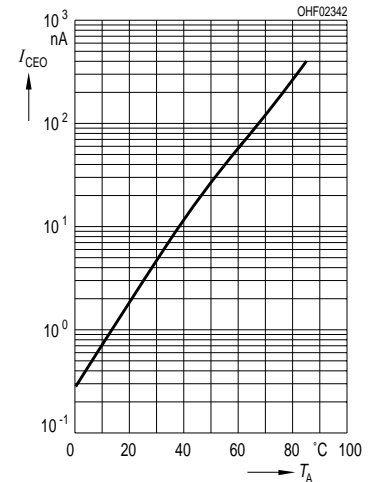
**Total Power Dissipation**

$P_{tot} = f(T_A)$

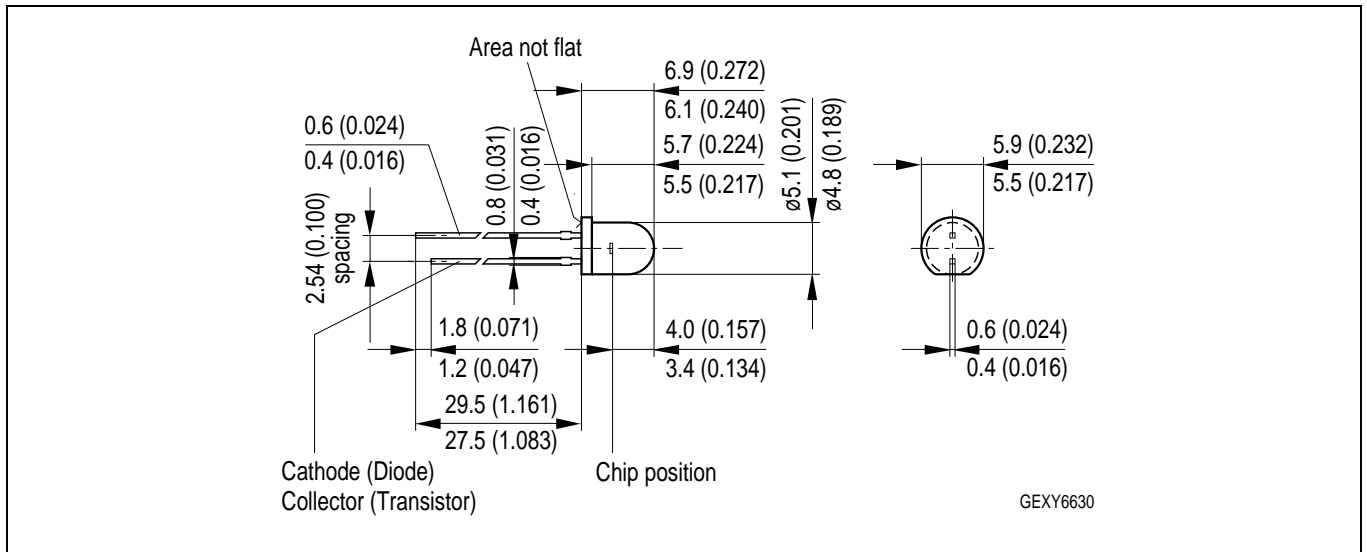


**Dark Current**

$I_{CEO} = f(T_A), V_{CE} = 10\text{ V}, E = 0$



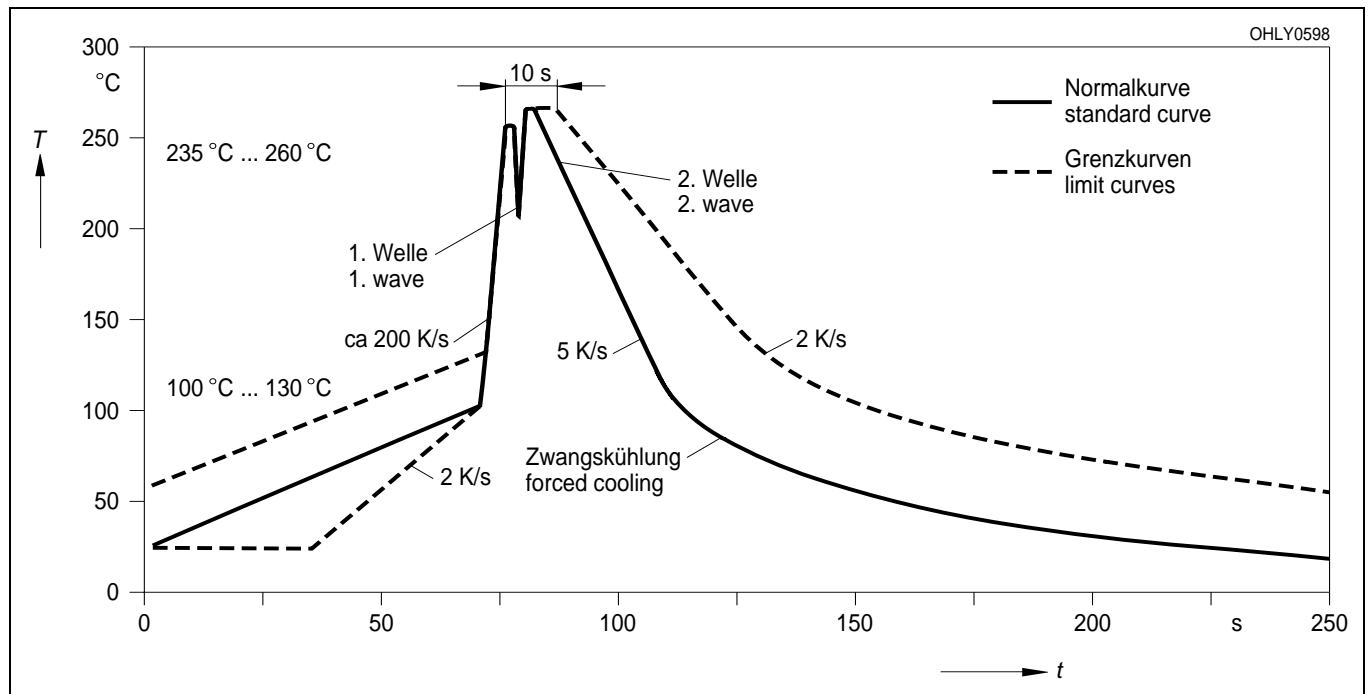
Maßzeichnung  
Package Outlines



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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