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# NPN-Silizium-Fototransistor
# Silicon NPN Phototransistor

## 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 | Q62702-P1668 |
| SFH 314-2 | Q62702-P1755 |
| SFH 314-2/3 | Q62702-P3600 |
| SFH 314-3 | Q62702-P1756 |
| SFH 314 FA | Q62702-P1675 |
| SFH 314 FA-2 | Q62702-P1757 |
| SFH 314 FA-2/3 | Q62702-P3599 |
| SFH 314 FA-3 | Q62702-P1758 |



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**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 |
| Löttemperatur bei Tauchlötung<br>Lötstelle ≥ 2 mm vom Gehäuse, Lötzeit $t \leq 5$ s<br>Dip soldering temperature ≥ 2 mm distance from case bottom, soldering time $t \leq 5$ s | $T_S$ | 260 | °C |
| Löttemperatur bei Kolbenlötung<br>Lötstelle ≥ 2 mm vom Gehäuse, Lötzeit $t \leq 3$ s<br>Iron soldering temperature ≥ 2 mm distance from case bottom $t \leq 3$ s | $T_S$ | 300 | °C |
| Kollektor-Emitterspannung<br>Collector-emitter voltage | $V_{CE}$ | 70 | V |
| Kollektorstrom<br>Collector current | $I_C$ | 50 | mA |
| Kollektorspitzenstrom, $\tau < 10$ µs<br>Collector surge current | $I_{CS}$ | 100 | mA |
| Emitter-Kollektorspannung<br>Emitter-collector voltage | $V_{EC}$ | 7 | V |
| Verlustleistung, $T_A = 25$ °C<br>Total power dissipation | $P_{tot}$ | 200 | mW |
| Wärmewiderstand<br>Thermal resistance | $R_{thJA}$ | 375 | K/W |

**Kennwerte** ($T_A$ = 25 °C, λ = 950 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 $S_{max}$ | λ | 460 … 1080 | 740 … 1080 | nm |
| Bestrahlungsempfindliche Fläche<br>Radiant sensitive area | $A$ | 0.55 | 0.55 | $mm^2$ |
| Abmessungen der Chipfläche<br>Dimensions of chip area | $L \times B$<br>$L \times W$ | 1 × 1 | 1 × 1 | mm × mm |
| Abstand Chipoberfläche zu Gehäuseoberfläche<br>Distance chip front to case surface | $H$ | 3.4 … 4.0 | 3.4… 4.0 | mm |
| Halbwinkel<br>Half angle | φ | ± 40 | ± 40 | Grad<br>deg. |
| Kapazität, $V_{CE}$ = 5 V, $f$ = 1 MHz, $E$ = 0<br>Capacitance | $C_{CE}$ | 10 | 10 | pF |
| Dunkelstrom<br>Dark current<br>$V_{CE}$ = 10 V, $E$ = 0 | $I_{CEO}$ | 3 (≤ 200) | 3 (≤ 200) | nA |
| Fotostrom<br>Photocurrent<br>$E_e$ = 0.5 mW/cm², $V_{CE}$ = 5 V<br>$E_v$ = 1000 lx, Normlicht/standard light A,<br>$V_{CE}$ = 5 V | <br><br>$I_{PCE}$<br>$I_{PCE}$ | <br><br>≥ 0.63<br>7 | <br><br>≥ 0.63<br>– | <br><br>mA<br>mA |



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**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.**

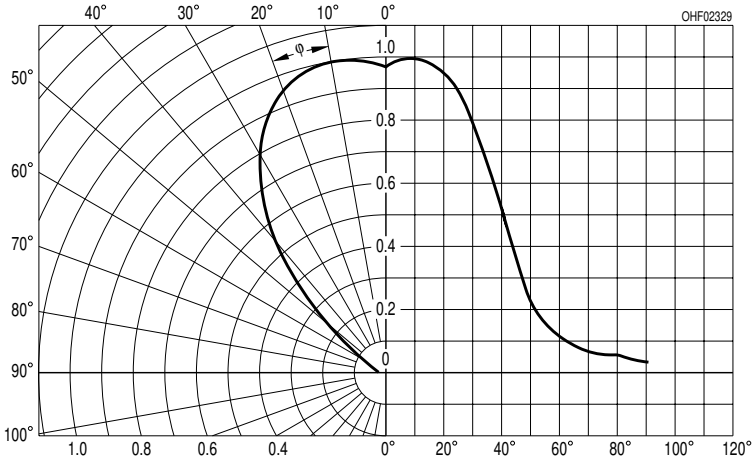
| Bezeichnung<br>Parameter | Symbol<br>Symbol | Wert<br>Value | | | | Einheit<br>Unit |
|---|---|---|---|---|---|---|
| | | -1 | -2 | -3 | -4 | |
| Fotostrom, $\lambda = 950$ nm<br>Photocurrent<br>$E_e$ = 0.5 mW/cm², $V_{CE}$ = 5 V | $I_{PCE}$ | 0.63 … 1.25 | 1 … 2 | 1.6 … 3.2 | ≥ 2.5 | mA |
| **SFH 314:**<br>$E_v$ = 1000 lx, Normlicht/<br>standard light A, $V_{CE}$ = 5 V | $I_{PCE}$ | 3.4 | 5.4 | 8.6 | 13.5 | mA |
| Anstiegszeit/Abfallzeit<br>Rise and fall time<br>$I_C$ = 1 mA, $V_{CC}$ = 5 V, $R_L$ = 1 kΩ | $t_r$, $t_f$ | 8 | 10 | 12 | 14 | µs |
| Kollektor-Emitter-Sättigungsspannung<br>Collector-emitter saturation voltage<br>$I_C = I_{PCEmin}$ [1] × 0.3,<br>$E_e$ = 0.5 mW/cm² | $V_{CEsat}$ | 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.

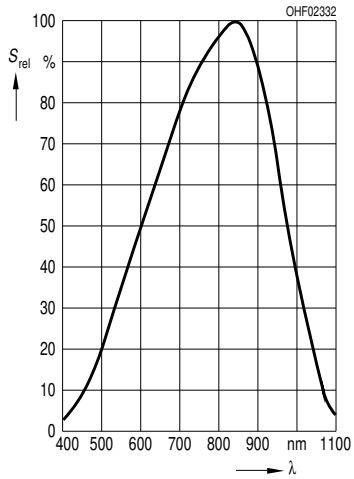
## Directional Characteristics

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

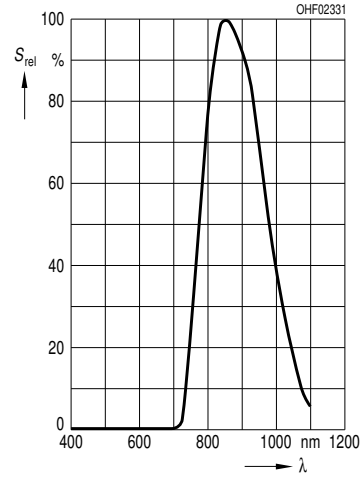


## $T_A$ = 25 °C, λ = 950 nm

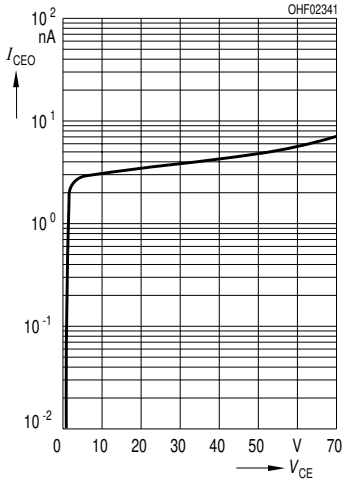
### Relative Spectral Sensitivity, SFH 314 $S_{rel} = f(\lambda)$



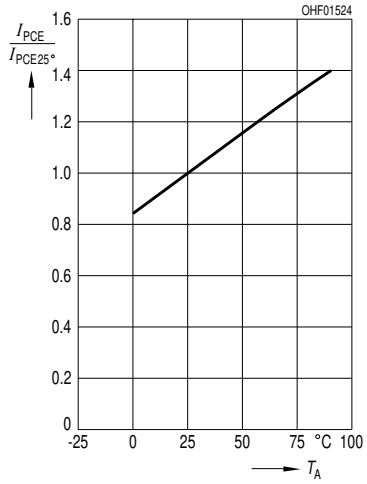

### Relative Spectral Sensitivity, SFH 314 FA $S_{rel} = f(\lambda)$



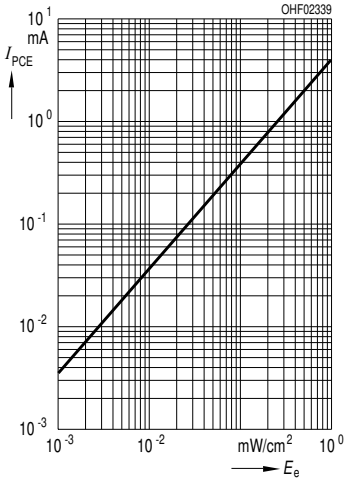

### Dark Current $I_{CEO} = f(V_{CE})$, $E$ = 0



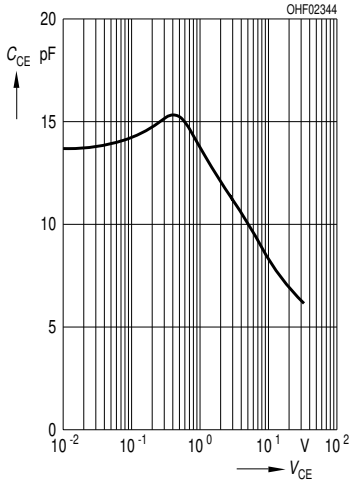

### Photocurrent $I_{PCE} = f(T_A)$, $V_{CE}$ = 5 V, normalized to 25 °C



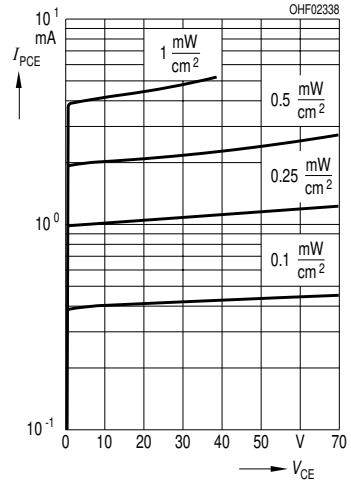

### Photocurrent $I_{PCE} = f(E_e)$, $V_{CE}$ = 5 V



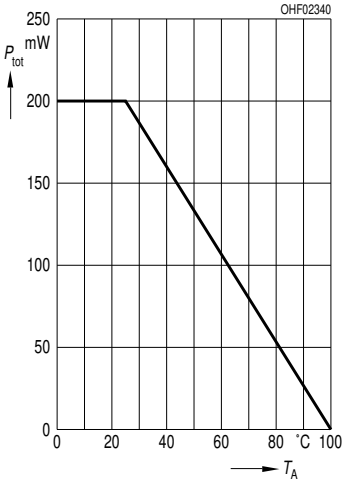

### Collector-Emitter Capacitance $C_{CE} = f(V_{CE})$, $f$ = 1 MHz



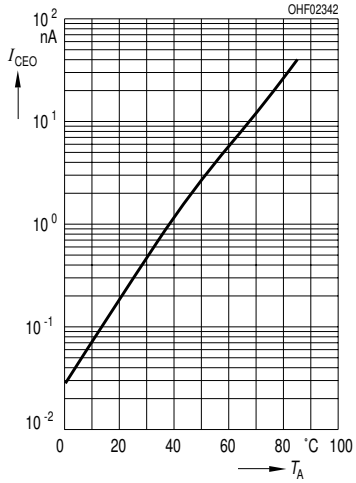

### Photocurrent $I_{PCE} = f(V_{CE})$, $E_e$ = parameter



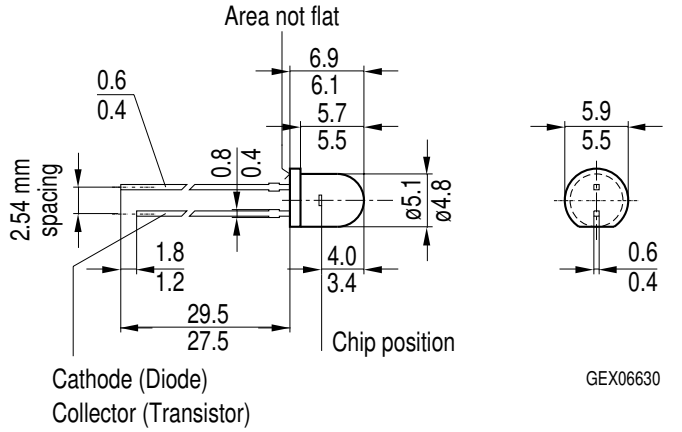

### Total Power Dissipation $P_{tot} = f(T_A)$




### Dark Current $I_{CEO} = f(T_A)$, $V_{CE}$ = 10 V, $E$ = 0



## Maßzeichnung
## Package Outlines




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