

# 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 314-2/3    | Q62702-P3600                   |
| SFH 314 FA     | Q62702-P1675                   |
| SFH 314 FA-2/3 | Q62702-P3599                   |

**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 $\geq 2$ mm vom Gehäuse, Lötzeit $t \leq 5$ s<br>Dip soldering temperature $\geq 2$ mm distance<br>from case bottom, soldering time $t \leq 5$ s | $T_S$             | 260            | °C              |
| Löttemperatur bei Kolbenlötung<br>Lötstelle $\geq 2$ mm vom Gehäuse, Lötzeit $t \leq 3$ s<br>Iron soldering temperature $\geq 2$ mm distance<br>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, $\tau < 10 \mu s$<br>Collector surge current                                                                                                                         | $I_{CS}$          | 100            | mA              |
| Emitter-Kollektorspannung<br>Emitter-collector voltage                                                                                                                                      | $V_{EC}$          | 7              | V               |
| Verlustleistung, $T_A = 25^\circ C$<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                                                                       | $\lambda_{S\text{ max}}$     | 850              | 870              | nm              |
| Spektraler Bereich der Fotoempfindlichkeit<br>$S = 10\%$ von $S_{\text{max}}$<br>Spectral range of sensitivity<br>$S = 10\%$ of $S_{\text{max}}$ | $\lambda$                    | 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         |
| Abstand Chipoberfläche zu<br>Gehäuseoberfläche<br>Distance chip front to case surface                                                            | $H$                          | 3.4 ... 4.0      | 3.4... 4.0       | mm              |
| Halbwinkel<br>Half angle                                                                                                                         | $\varphi$                    | ± 40             | ± 40             | Grad<br>deg.    |
| Kapazität, $V_{\text{CE}} = 5\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$<br>Capacitance                                                            | $C_{\text{CE}}$              | 10               | 10               | pF              |
| Dunkelstrom<br>Dark current<br>$V_{\text{CE}} = 10\text{ V}$ , $E = 0$                                                                           | $I_{\text{CEO}}$             | 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.

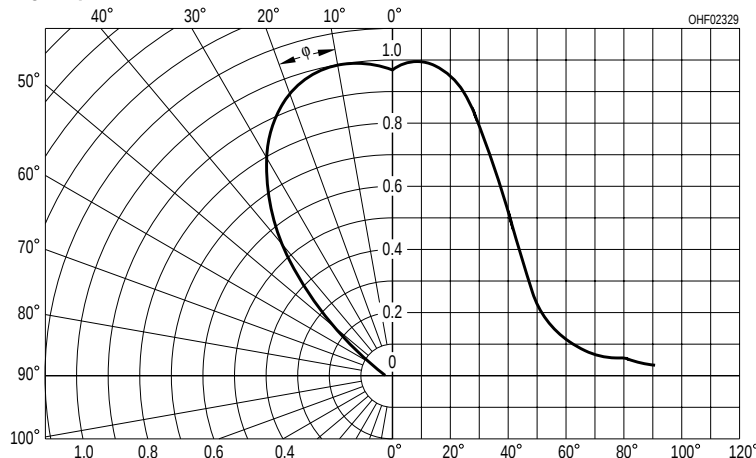
| Bezeichnung<br>Parameter                                                                                                                                                                                             | Symbol<br>Symbol | Wert<br>Value |         |             |            | Einheit<br>Unit |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------|---------|-------------|------------|-----------------|
|                                                                                                                                                                                                                      |                  | -1            | -2      | -3          | -4         |                 |
| Fotostrom, $\lambda = 950 \text{ nm}$<br>Photocurrent<br>$E_e = 0.5 \text{ mW/cm}^2$ , $V_{CE} = 5 \text{ V}$<br><b>SFH 314:</b><br>$E_v = 1000 \text{ lx}$ , Normlicht/<br>standard light A, $V_{CE} = 5 \text{ V}$ | $I_{PCE}$        | 0.63 ... 1.25 | 1 ... 2 | 1.6 ... 3.2 | $\geq 2.5$ | mA              |
|                                                                                                                                                                                                                      | $I_{PCE}$        | 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-Sättigungsspannung<br>Collector-emitter saturation 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              |

<sup>1)</sup>  $I_{PCEmin}$  ist der minimale Fotostrom der jeweiligen Gruppe.

<sup>1)</sup>  $I_{PCEmin}$  is the min. photocurrent of the specified group.

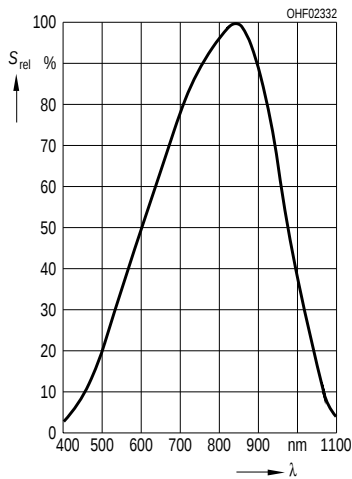
### Directional Characteristics

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

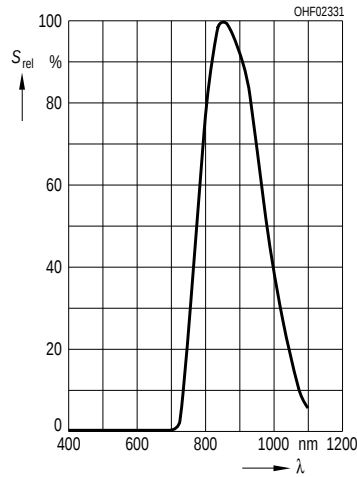


$T_A = 25^\circ\text{C}$ ,  $\lambda = 950\text{ nm}$

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

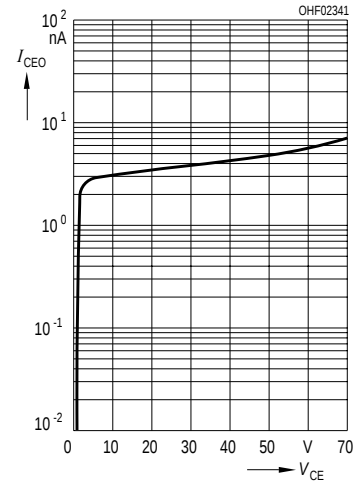


**Relative Spectral Sensitivity,**  
SFH 314 FA  $S_{\text{rel}} = f(\lambda)$

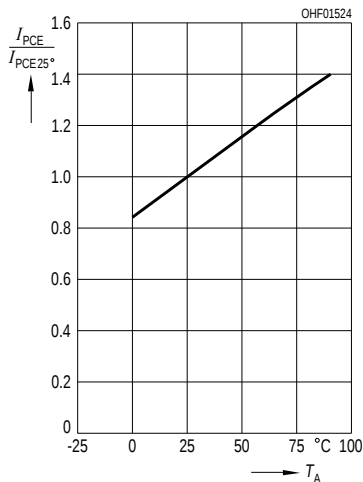


**Dark Current**

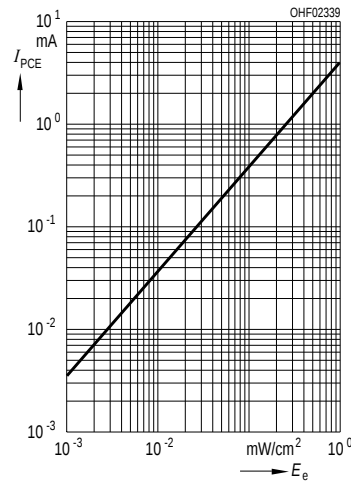
$I_{\text{CEO}} = f(V_{\text{CE}})$ ,  $E = 0$



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

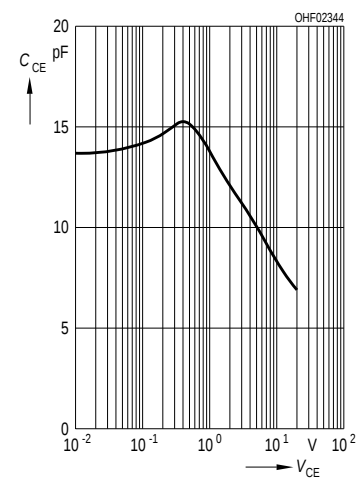


**Photocurrent**  
 $I_{\text{PCE}} = f(E_e)$ ,  $V_{\text{CE}} = 5\text{ V}$

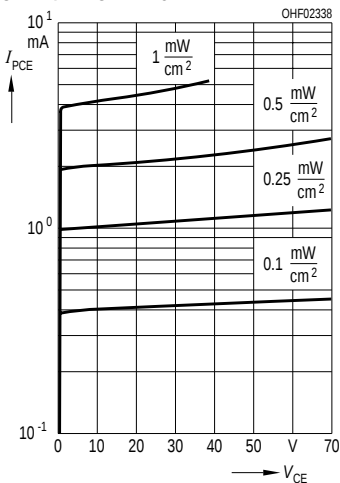


**Collector-Emitter Capacitance**

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

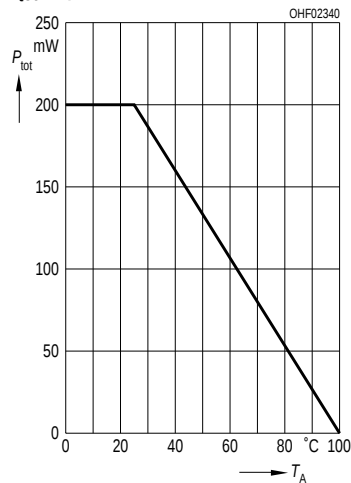


**Photocurrent**  
 $I_{\text{PCE}} = f(V_{\text{CE}})$ ,  $E_e = \text{parameter}$



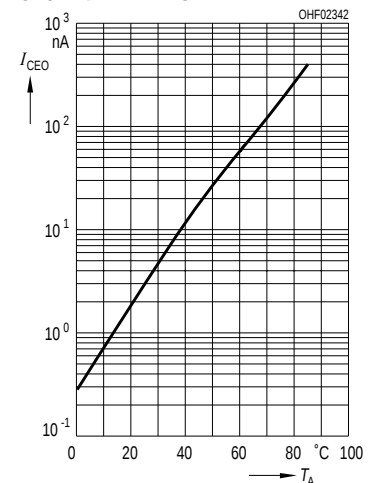
**Total Power Dissipation**

$P_{\text{tot}} = f(T_A)$

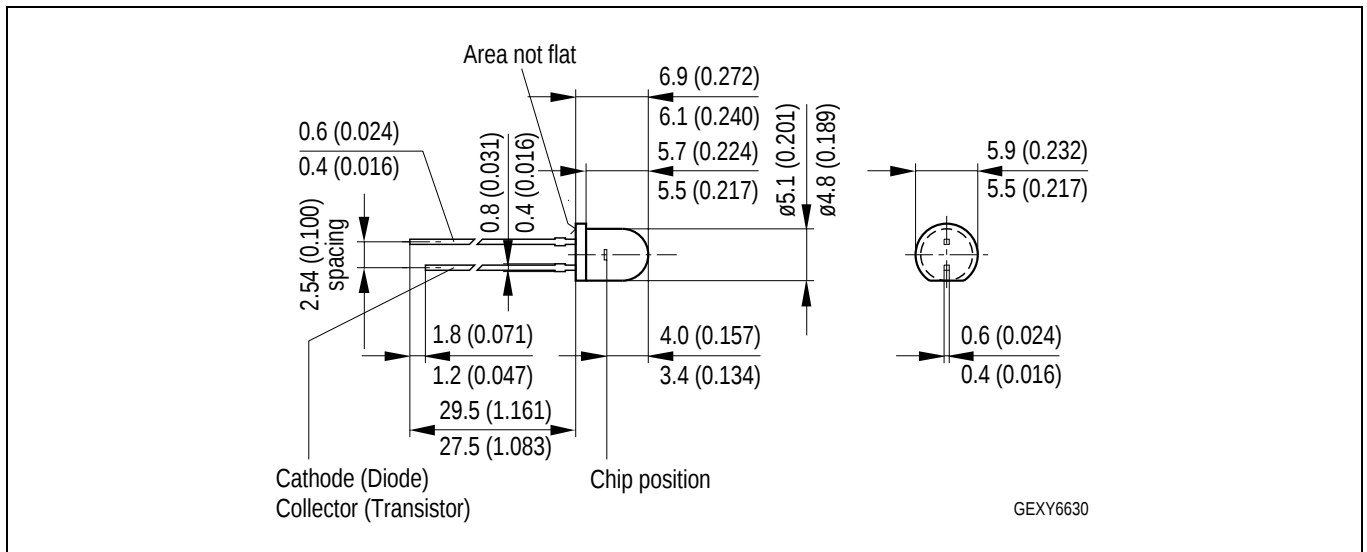


**Dark Current**

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



## Maßzeichnung Package Outlines



Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

Published by OSRAM Opto Semiconductors GmbH & Co. OHG  
Wernerwerkstrasse 2, D-93049 Regensburg

© All Rights Reserved.

### Attention please!

The information describes the type of component and shall not be considered as assured characteristics. Terms of delivery and rights to change design reserved. Due to technical requirements components may contain dangerous substances. For information on the types in question please contact our Sales Organization.

### Packing

Please use the recycling operators known to you. We can also help you – get in touch with your nearest sales office. By agreement we will take packing material back, if it is sorted. You must bear the costs of transport. For packing material that is returned to us unsorted or which we are not obliged to accept, we shall have to invoice you for any costs incurred.

**Components used in life-support devices or systems must be expressly authorized for such purpose!** Critical components<sup>1</sup>, may only be used in life-support devices or systems<sup>2</sup> with the express written approval of OSRAM OS.

<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.