

# 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 Type	Bestellnummer 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 Parameter	Symbol Symbol	Wert Value	Einheit Unit
Betriebs- und Lagertemperatur Operating and storage temperature range	$T_{op}; T_{stg}$	- 40 ... + 100	°C
Löttemperatur bei Tauchlötung Lötstelle $\geq 2$ mm vom Gehäuse, Lötzeit $t \leq 5$ s Dip soldering temperature $\geq 2$ mm distance from case bottom, soldering time $t \leq 5$ s	$T_S$	260	°C
Löttemperatur bei Kolbenlötung Lötstelle $\geq 2$ mm vom Gehäuse, Lötzeit $t \leq 3$ s Iron soldering temperature $\geq 2$ mm distance from case bottom $t \leq 3$ s	$T_S$	300	°C
Kollektor-Emitterspannung Collector-emitter voltage	$V_{CE}$	70	V
Kollektorstrom Collector current	$I_C$	50	mA
Kollektorspitzenstrom, $\tau < 10 \mu s$ Collector surge current	$I_{CS}$	100	mA
Emitter-Kollektorspannung Emitter-collector voltage	$V_{EC}$	7	V
Verlustleistung, $T_A = 25 \text{ °C}$ Total power dissipation	$P_{tot}$	200	mW
Wärmewiderstand Thermal resistance	$R_{thJA}$	375	K/W

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

## Characteristics

Bezeichnung Parameter	Symbol Symbol	Wert Value		Einheit Unit
		SFH 314	SFH 314 FA	
Wellenlänge der max. Fotoempfindlichkeit Wavelength of max. sensitivity	$\lambda_{S\text{ max}}$	850	870	nm
Spektraler Bereich der Fotoempfindlichkeit $S = 10\%$ von $S_{\text{max}}$ Spectral range of sensitivity $S = 10\%$ of $S_{\text{max}}$	$\lambda$	460 ... 1080	740 ... 1080	nm
Bestrahlungsempfindliche Fläche Radiant sensitive area	$A$	0.55	0.55	mm <sup>2</sup>
Abmessungen der Chipfläche Dimensions of chip area	$L \times B$ $L \times W$	1 × 1	1 × 1	mm × mm
Abstand Chipoberfläche zu Gehäuseoberfläche Distance chip front to case surface	$H$	3.4 ... 4.0	3.4... 4.0	mm
Halbwinkel Half angle	$\varphi$	± 40	± 40	Grad deg.
Kapazität, $V_{\text{CE}} = 5\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$ Capacitance	$C_{\text{CE}}$	10	10	pF
Dunkelstrom Dark current $V_{\text{CE}} = 10\text{ V}$ , $E = 0$	$I_{\text{CEO}}$	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.

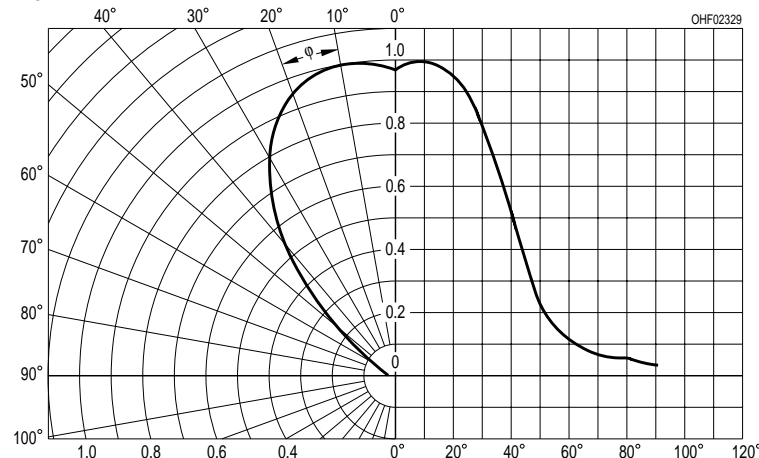
Bezeichnung Parameter	Symbol Symbol	Wert Value				Einheit Unit
		-1	-2	-3	-4	
Fotostrom, $\lambda = 950 \text{ nm}$ Photocurrent $E_e = 0.5 \text{ mW/cm}^2, V_{CE} = 5 \text{ V}$	$I_{PCE}$	0.63 ... 1.25	1 ... 2	1.6 ... 3.2	$\geq 2.5$	mA
<b>SFH 314:</b> $E_v = 1000 \text{ lx}$ , Normlicht/ standard light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

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

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

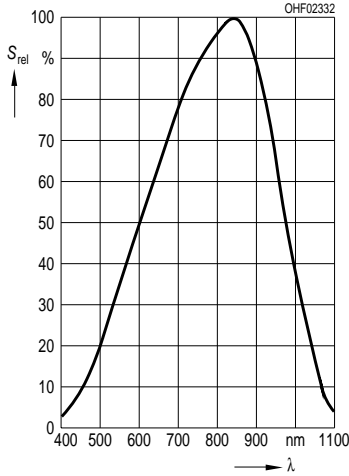
### Directional Characteristics

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

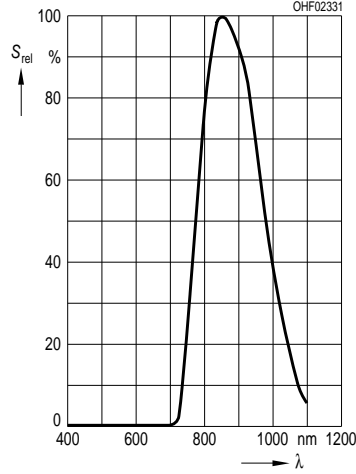


$T_A = 25\text{ }^\circ\text{C}$ ,  $\lambda = 950\text{ nm}$

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

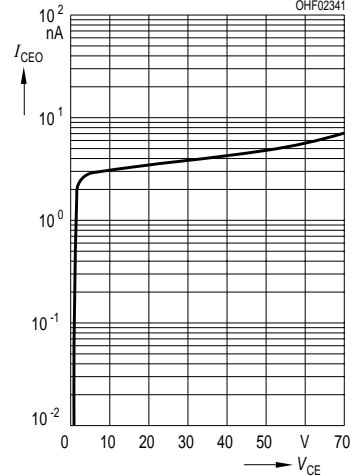


**Relative Spectral Sensitivity, SFH 314 FA**  $S_{rel} = f(\lambda)$

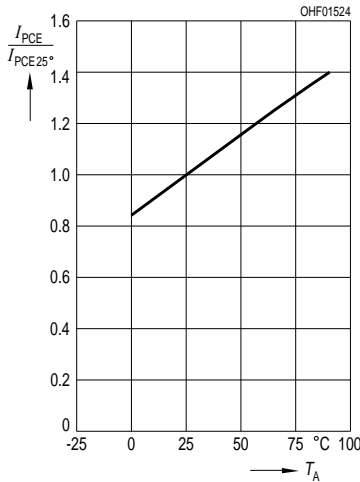


**Dark Current**

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

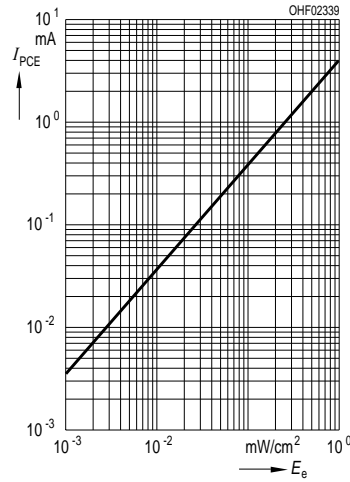


**Photocurrent**  $I_{PCE} = f(T_A)$ ,  $V_{CE} = 5\text{ V}$ , normalized to  $25\text{ }^\circ\text{C}$



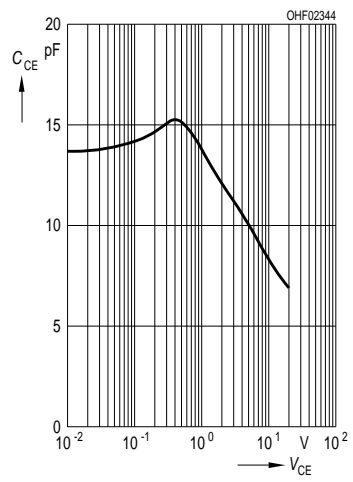
**Photocurrent**

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



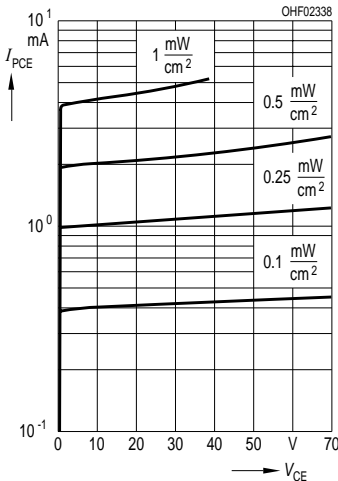
**Collector-Emitter Capacitance**

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



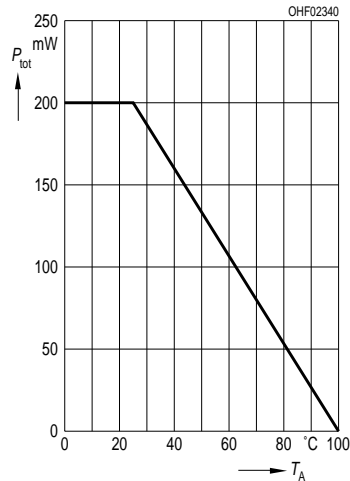
**Photocurrent**

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



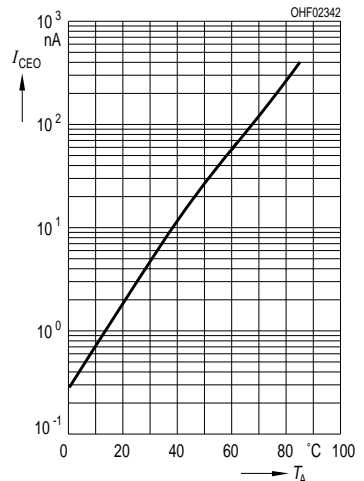
**Total Power Dissipation**

$P_{tot} = f(T_A)$

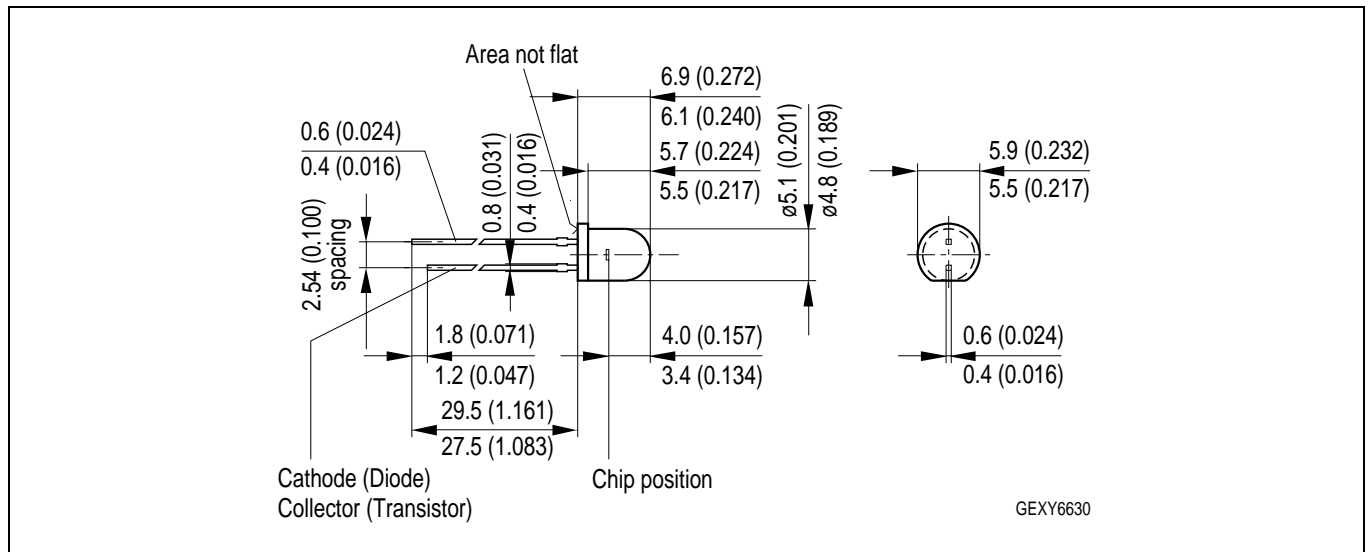


**Dark Current**

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



## Maßzeichnung Package Outlines



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

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### 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.

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