

# NPN-Silizium-Fototransistor

## Silicon NPN Phototransistor

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

#### SFH 313

#### SFH 313 FA



SFH 313



SFH 313 FA

#### Wesentliche Merkmale

- Speziell geeignet für Anwendungen im Bereich von 460 nm bis 1080 nm (SFH 313) und bei 880 nm (SFH 313 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 313) and of 880 nm (SFH 313 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 313	Q62702P1667
SFH 313-2/3	Q62702P3598
SFH 313 FA	Q62702P1674
SFH 313 FA-2/3	Q62702P3597
SFH 313 FA-3/4	Q62702P5196

**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
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 313	SFH 313 FA	
Wellenlänge der max. Fotoempfindlichkeit Wavelength of max. sensitivity	$\lambda_{S_{\max}}$	850	870	nm
Spektraler Bereich der Fotoempfindlichkeit $S = 10\%$ von $S_{\max}$ Spectral range of sensitivity $S = 10\%$ of $S_{\max}$	$\lambda$	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
Halbwinkel Half angle	$\varphi$	± 10	± 10	Grad deg.
Kapazität, $V_{CE} = 5\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$ Capacitance	$C_{CE}$	10	10	pF
Dunkelstrom Dark current $V_{CE} = 20\text{ V}$ , $E = 0$	$I_{CEO}$	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.

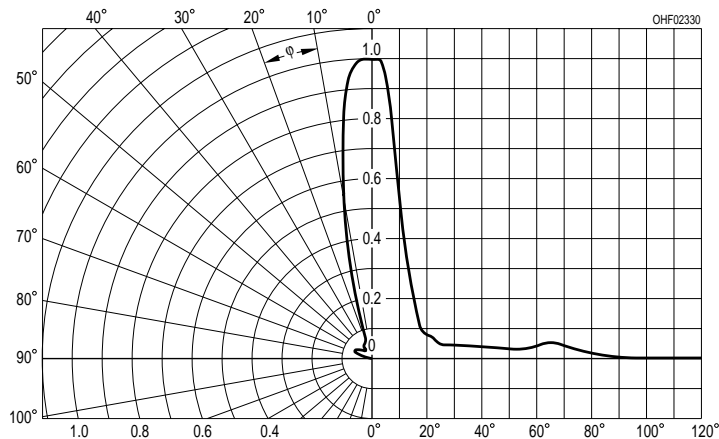
Bezeichnung Parameter	Symbol Symbol	Wert Value				Einheit Unit
		-1	-2	-3	-4	
Fotostrom, $\lambda = 950 \text{ nm}$ Photocurrent $E_e = 0.5 \text{ mW/cm}^2, V_{CE} = 5 \text{ V}$	$I_{PCE}$	2.5 ... 5	4 ... 8	6.3 ... 12.5	$\geq 10$	mA
Anstiegszeit/Abfallzeit Rise and fall time $I_C = 1 \text{ mA}, V_{CC} = 5 \text{ V}, R_L = 1 \text{ k}\Omega$	$t_r, t_f$	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

<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.

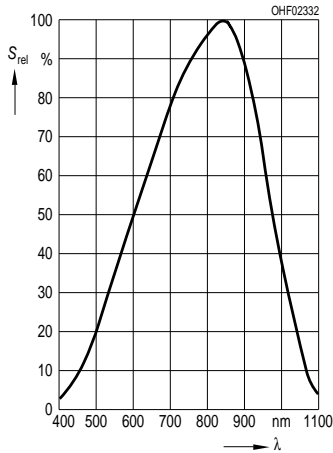
### Directional Characteristics

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

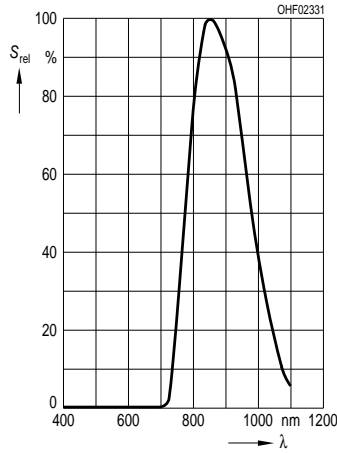


$T_A = 25\text{ }^\circ\text{C}$ ,  $\lambda = 950\text{ nm}$

Relative Spectral Sensitivity,  
SFH 313  $S_{rel} = f(\lambda)$

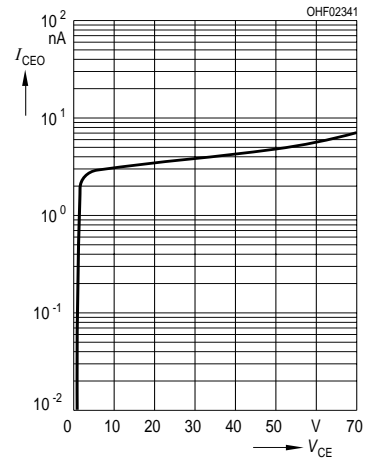


Relative Spectral Sensitivity,  
SFH 313 FA  $S_{rel} = f(\lambda)$

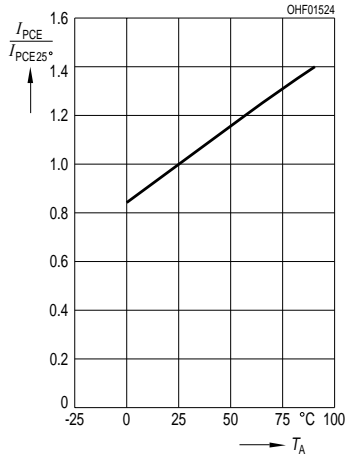


Dark Current

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

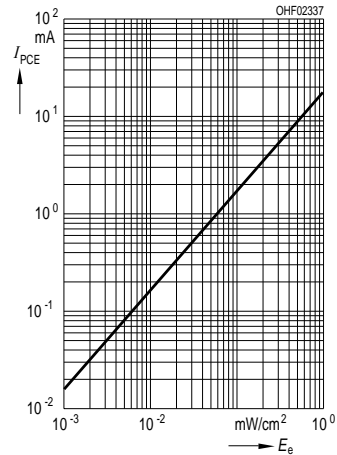


Photocurrent  $I_{PCE} = f(T_A)$ ,  
 $V_{CE} = 5\text{ V}$ , normalized to  $25\text{ }^\circ\text{C}$



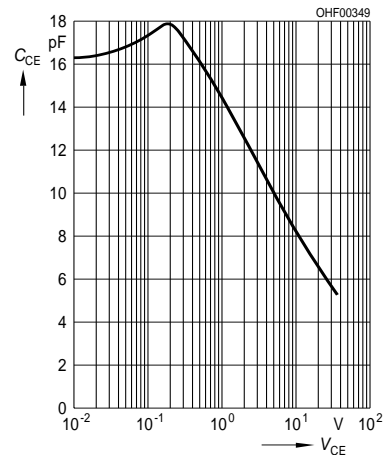
Photocurrent

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



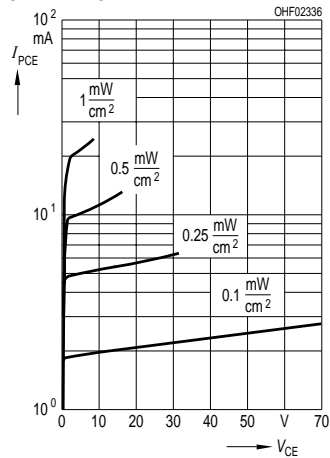
Collector-Emitter Capacitance

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



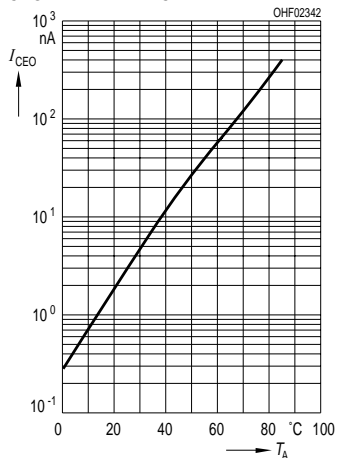
Photocurrent

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



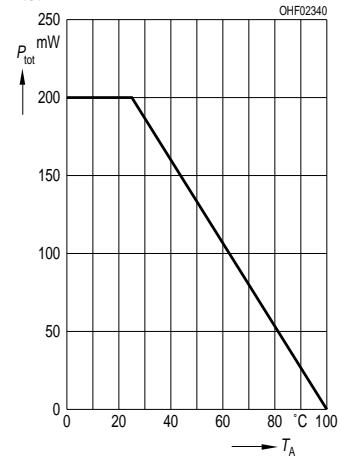
Dark Current

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

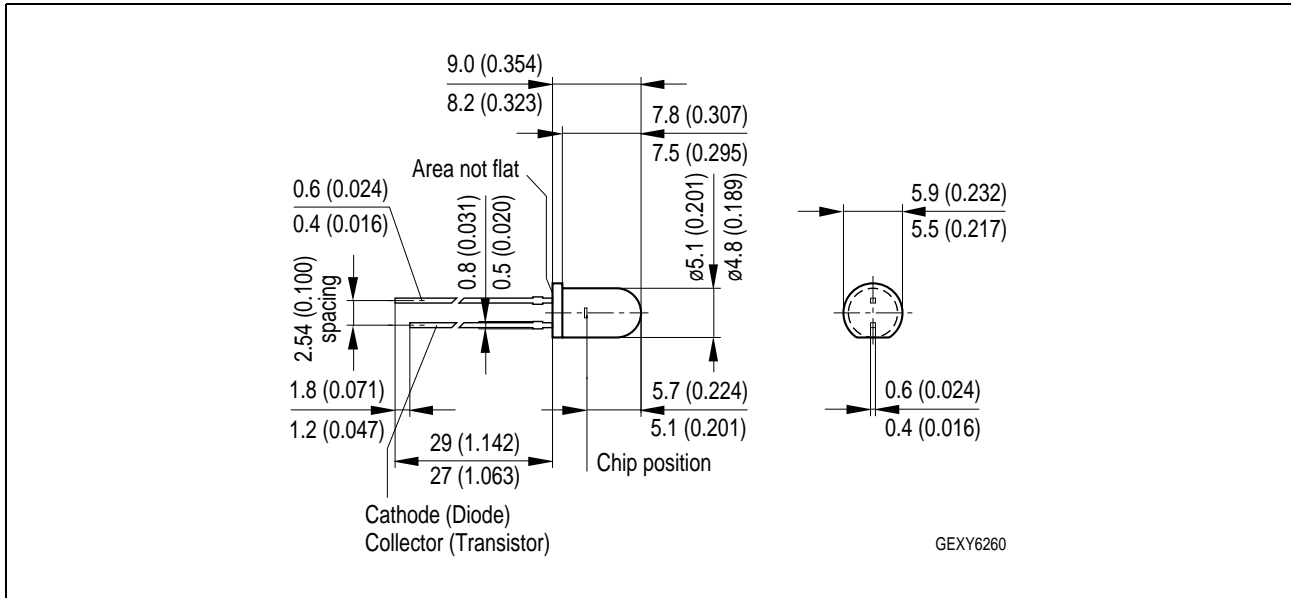


Total Power Dissipation

$P_{tot} = f(T_A)$



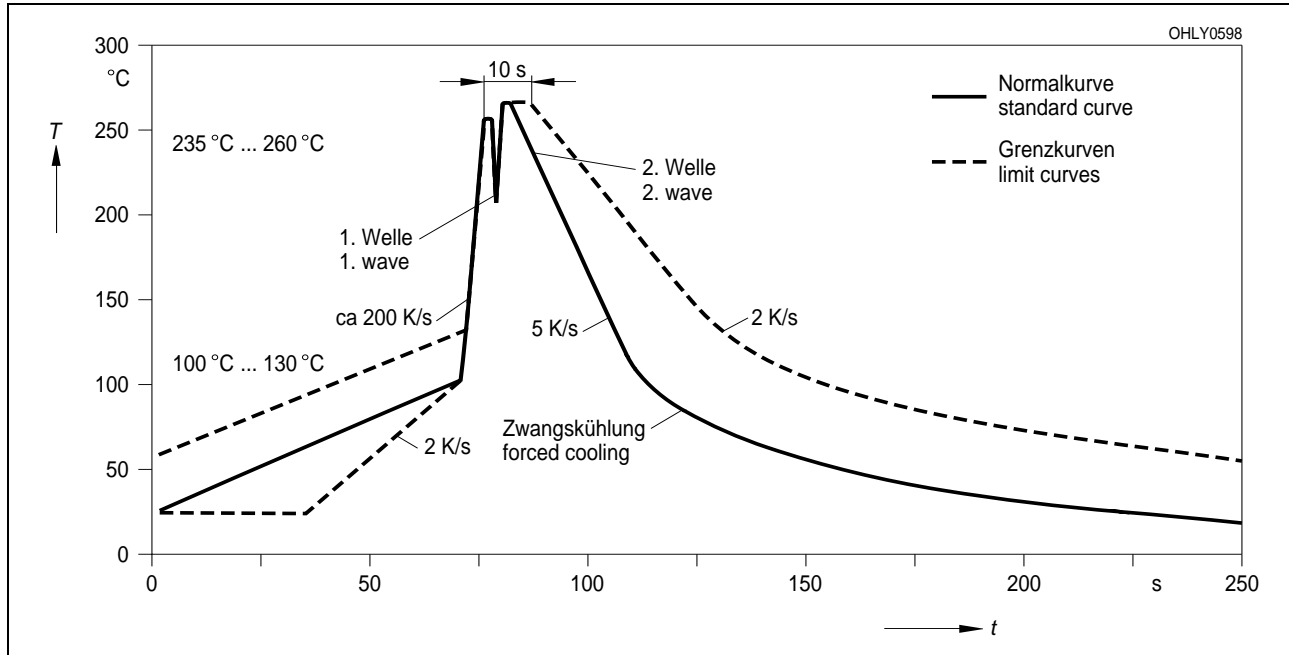
Maßzeichnung  
Package Outlines



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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