

**NPN-Silizium-Fototransistor**  
**Silicon NPN Phototransistor**  
**Lead (Pb) Free Product - RoHS Compliant**

**SFH 310**  
**SFH 310 FA**



SFH 310



SFH 310 FA

**Wesentliche Merkmale**

- **Spektraler Bereich der Fotoempfindlichkeit:**  
450 nm ... 1100 nm (SFH 310)
- 740 nm ... 1100 nm (SFH 310FA)
- **Gehäuse:** 3mm Radial (T1), Harz
- **Besonderheit des Bauteils:**  
hohe Fotoempfindlichkeit

**Features**

- **Spectral Range of Sensitivity:**  
450 nm ... 1100 nm (SFH 310)
- 740 nm ... 1100 nm (SFH 310FA)
- **Package:** 3 mm Radial (T1), Epoxy
- **Feature of the device:**  
high photosensitivity

**Anwendungen**

- Lichtschranken
- Industrieelektronik
- „Messen/Steuern/Regeln“

**Applications**

- Photointerrupters
- Industrial electronics
- For control and drive circuits

Typ Type	Bestellnummer Ordering Code	Fotostrom, $E_e = 0.5\text{mW/cm}^2$ , $\lambda = 950\text{nm}$ , $V_{CE} = 5\text{V}$ Photocurrent $I_{pce}$ (mA)
SFH 310	Q62702P0874	$\geq 0.63$
SFH 310-2/3	Q62702P3595	0.63...2.0
SFH 310 FA	Q62702P1673	$\geq 0.63$
SFH 310 FA-2/3	Q62702P3596	0.63...2.0

**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	$V_{CE}$	35	V
Kollektorstrom Collector current	$I_C$	50	mA
Kollektorspitzenstrom, $\tau < 10 \mu s$ Collector surge current	$I_{CS}$	100	mA
Verlustleistung, $T_A = 25 \text{ }^\circ\text{C}$ Total power dissipation	$P_{tot}$	165	mW
Wärmewiderstand Thermal resistance	$R_{thJA}$	450	K/W

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

## Characteristics

Bezeichnung Parameter	Symbol Symbol	Wert Value		Einheit Unit
		SFH 310	SFH 310 FA	
Wellenlänge der max. Fotoempfindlichkeit Wavelength of max. sensitivity	$\lambda_{S\text{ max}}$	880	890	nm
Spektraler Bereich der Fotoempfindlichkeit $S = 10\%$ von $S_{\text{max}}$ Spectral range of sensitivity $S = 10\%$ of $S_{\text{max}}$	$\lambda$	450 ... 1100	740 ... 1100	nm
Bestrahlungsempfindliche Fläche Radiant sensitive area	$A$	0.11	0.11	mm <sup>2</sup>
Abmessung der Chipfläche Dimensions of chip area	$L \times B$ $L \times W$	$0.5 \times 0.5$	$0.5 \times 0.5$	mm × mm
Halbwinkel Half angle	$\varphi$	$\pm 25$	$\pm 25$	Grad deg.
Kapazität, $V_{\text{CE}} = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$ Capacitance	$C_{\text{CE}}$	7.5	7.5	pF
Dunkelstrom Dark current $V_{\text{CE}} = 10\text{ V}$ , $E = 0$	$I_{\text{CEO}}$	1 ( $\leq 50$ )	1 ( $\leq 50$ )	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.

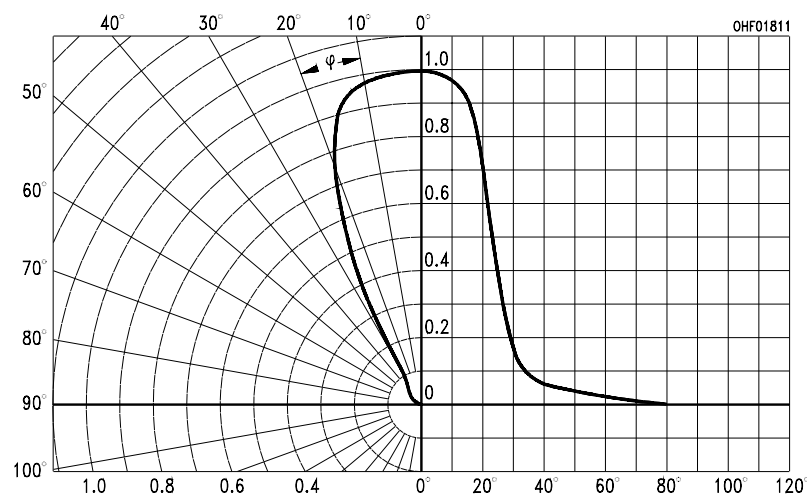
Bezeichnung Parameter	Symbol Symbol	Wert Value			Einheit Unit
		-2	-3	-4	
Fotostrom, $\lambda = 950 \text{ nm}$ Photocurrent $E_e = 0.5 \text{ mW/cm}^2, V_{CE} = 5 \text{ V}$	$I_{PCE}$	0.63 ... 1.25	1.0 ... 2.0	1.6 ... 3.2	mA
<b>SFH 310:</b> $E_v = 1000 \text{ lx}$ , Normlicht/ standard light A, $V_{CE} = 5 \text{ V}$	$I_{PCE}$	3.0	4.8	7.7	mA
Anstiegszeit/Abfallzeit Rise and fall time $I_C = 1 \text{ mA}, V_{CC} = 5 \text{ V}, R_L = 1 \text{ k}\Omega$	$t_r, t_f$	5	8	12	$\mu\text{s}$
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	mV

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

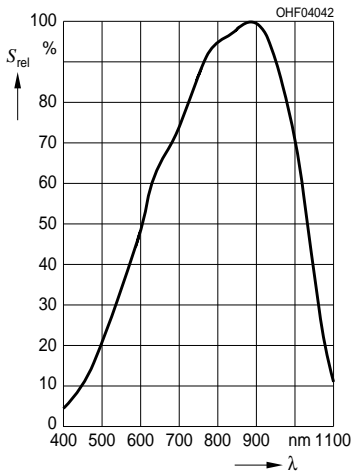
1)  $I_{PCEmin}$  is the min. photocurrent of the specified group.

### Directional Characteristics

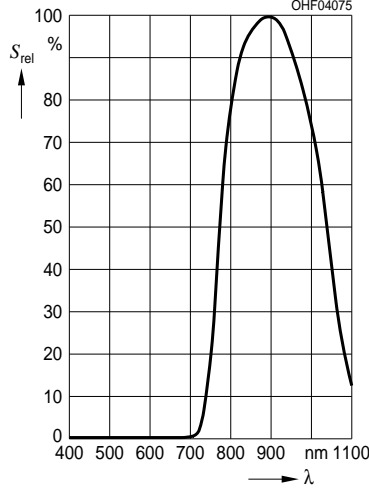
$$S_{rel} = f(\varphi)$$



**Relative Spectral Sensitivity, SFH 310**  $S_{rel} = f(\lambda)$

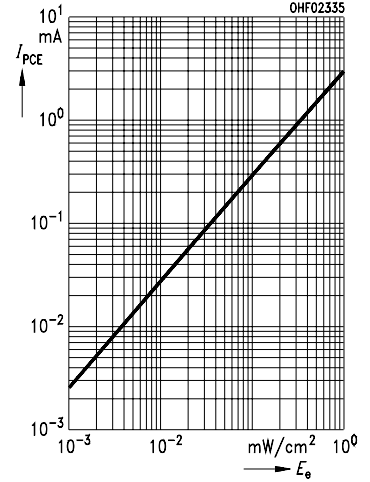


**Relative Spectral Sensitivity, SFH 310 FA**  $S_{rel} = f(\lambda)$



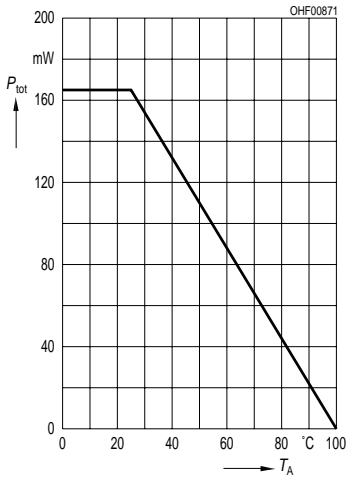
**Photocurrent**

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



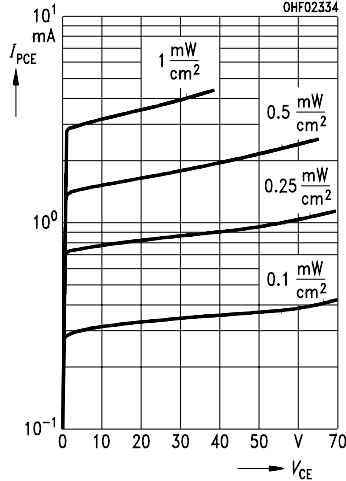
**Total Power Dissipation**

$P_{tot} = f(T_A)$



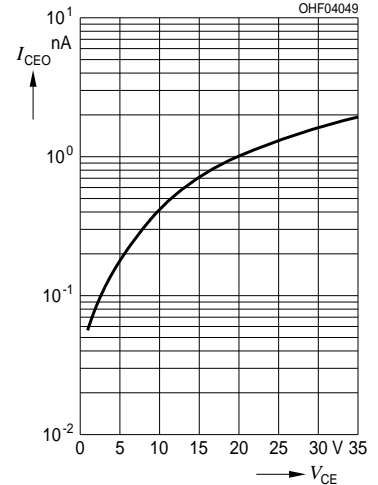
**Photocurrent**

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



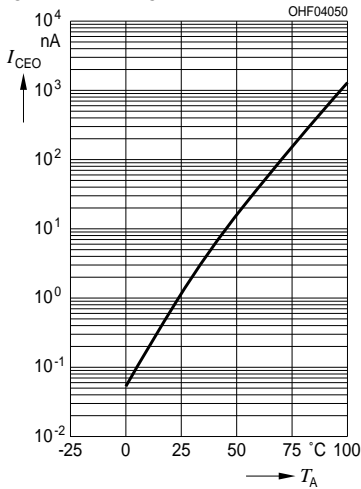
**Dark Current**

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



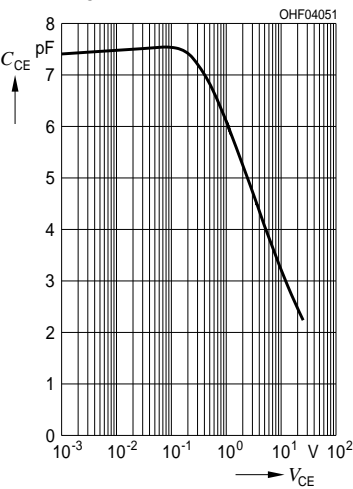
**Dark Current**

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



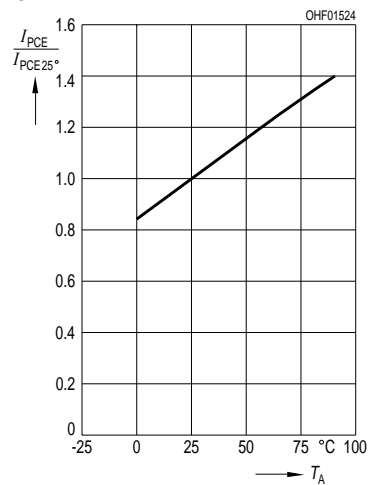
**Capacitance**

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

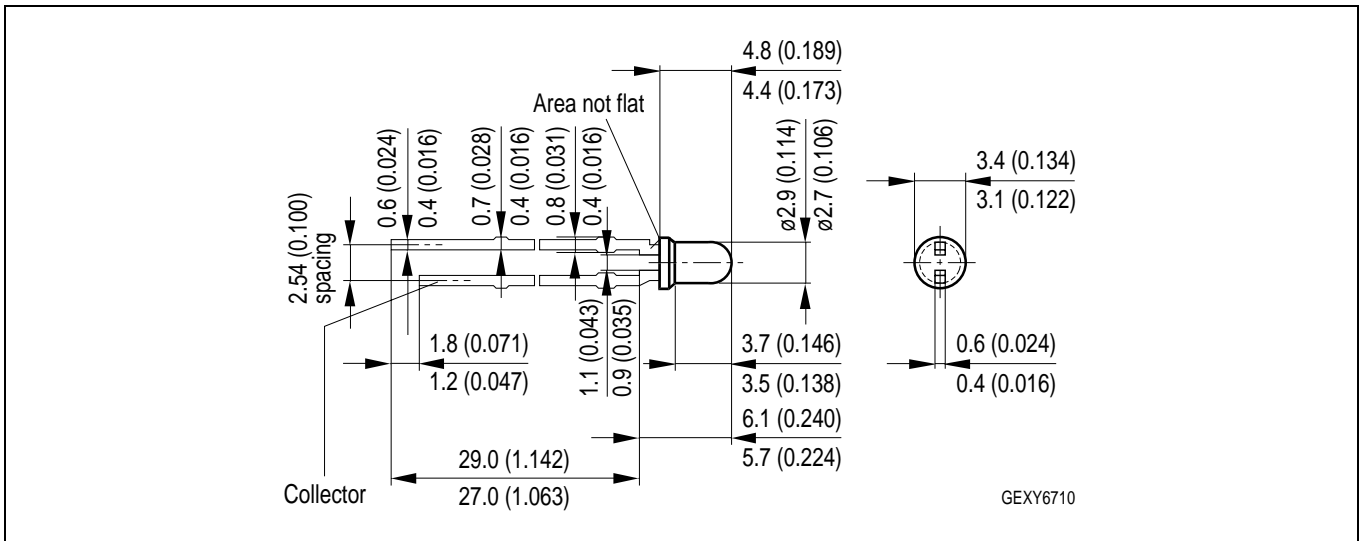


**Photocurrent**  $I_{PCE} = f(T_A), V_{CE} = 5 V, \text{normalized to } 25^\circ \text{C}$

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



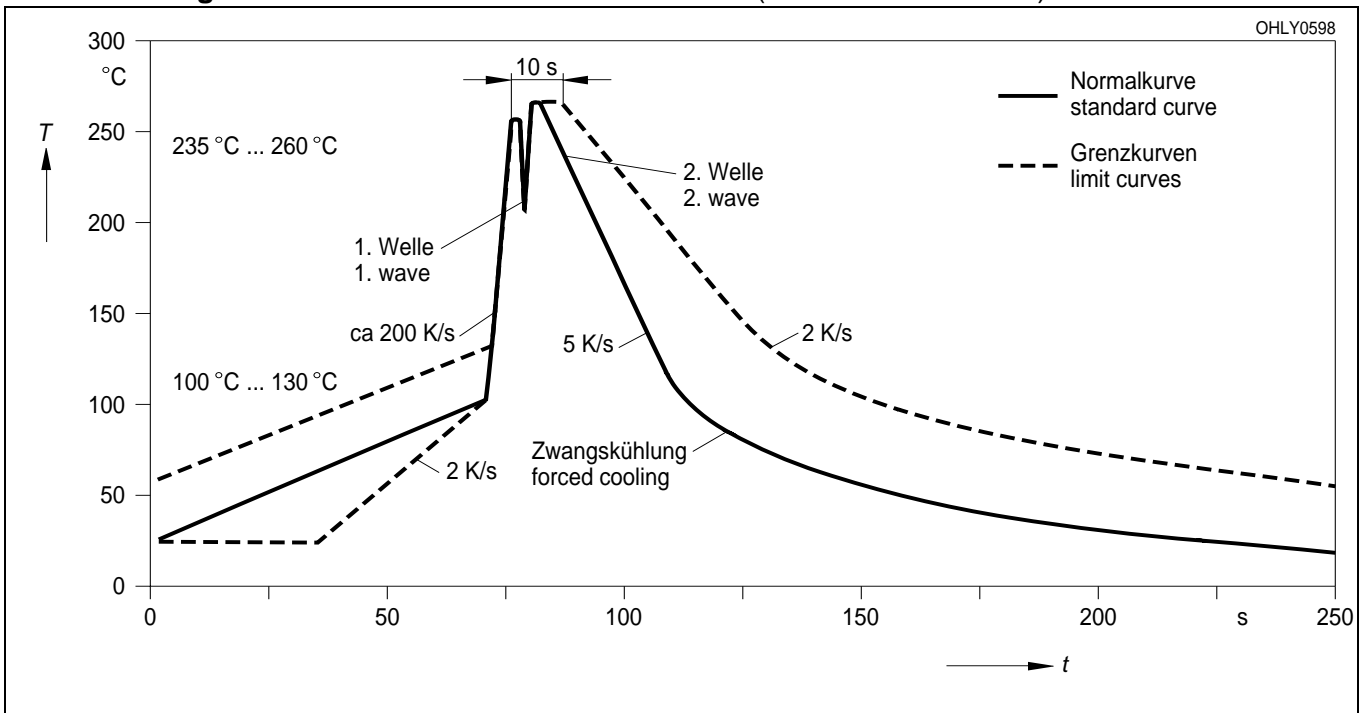
**Maßzeichnung  
Package Outlines**



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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