NPN-Silizium-Fototransistor
Silicon NPN Phototransistor

SFH 310
SFH 310 FA

SFH 310

SFH 310 FA

Wesentliche Merkmale

- Speziell geeignet für Anwendungen im Bereich von 400 nm bis 1100 nm (SFH 310) und bei 880 nm (SFH 310 FA)
- Hohe Linearität
- 3 mm-Plastikbauform

Anwendungen

- Lichtschranken für Gleich- und Wechsellichtbetrieb
- Industrieelektronik
- „Messen/Steuern/Regeln“

Features

- Especially suitable for applications from 400 nm to 1100 nm (SFH 310) and of 880 nm (SFH 310 FA)
- High linearity
- 3 mm plastic package

Applications

- Photointerrupters
- Industrial electronics
- For control and drive circuits

Typ Type	Bestellnummer Ordering Code
SFH 310 SFH 310-2/3	Q62702-P874 Q62702-P3595
SFH 310 FA SFH 310 FA-2/3	Q62702-P1673 Q62702-P3596

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 ≥ 2 mm vom Gehäuse, Lötzeit $t \leq 5$ s Dip soldering temperature ≥ 2 mm distance from case bottom, soldering time $t \leq 5$ s	T_S	260	°C
Löttemperatur bei Kolbenlötung Lötstelle ≥ 2 mm vom Gehäuse, Lötzeit $t \leq 3$ s Iron soldering temperature ≥ 2 mm distance from case bottom, soldering time $t \leq 3$ s	T_S	300	°C
Kollektor-Emitterspannung Collector-emitter voltage	V_{CE}	70	V
Kollektorstrom Collector current	I_C	50	mA
Kollektorspitzenstrom, $\tau < 10$ µs Collector surge current	I_{CS}	100	mA
Verlustleistung, $T_A = 25$ °C Total power dissipation	P_{tot}	165	mW
Wärmewiderstand Thermal resistance	R_{thJA}	450	K/W

Kennwerte (T_A = 25 °C, λ = 950 nm)
Characteristics

Bezeichnung **Parameter**	**Symbol** **Symbol**	**Wert** **Value**		**Einheit** **Unit**
		SFH 310	**SFH 310 FA**	
Wellenlänge der max. Fotoempfindlichkeit Wavelength of max. sensitivity	$\lambda_{S\ max}$	780	880	nm
Spektraler Bereich der Fotoempfindlichkeit S = 10% von S_{max} Spectral range of sensitivity S = 10% of S_{max}	λ	470 … 1070	740 … 1070	nm
Bestrahlungsempfindliche Fläche Radiant sensitive area	A	0.19	0.19	mm^2
Abmessung der Chipfläche Dimensions of chip area	$L \times B$ $L \times W$	0.65 × 0.65	0.65 × 0.65	mm × mm
Abstand Chipoberfläche zu Gehäuseoberfläche Distance chip front to case surface	H	2.1 … 2.7	2.1 … 2.7	mm
Halbwinkel Half angle	φ	± 25	± 25	Grad deg.
Kapazität, V_{CE} = 0 V, f = 1 MHz, E = 0 Capacitance	C_{CE}	10	10	pF
Dunkelstrom Dark current V_{CE} = 10 V, E = 0	I_{CEO}	5 (≤ 100)	5 (≤ 100)	nA
Fotostrom Photocurrent E_e = 0.5 mW/cm², V_{CE} = 5 V E_v = 1000 lx, Normlicht/standard light A, V_{CE} = 5 V	 I_{PCE} I_{PCE}	 ≥ 0.4 4	 ≥ 0.4 –	 mA mA

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.

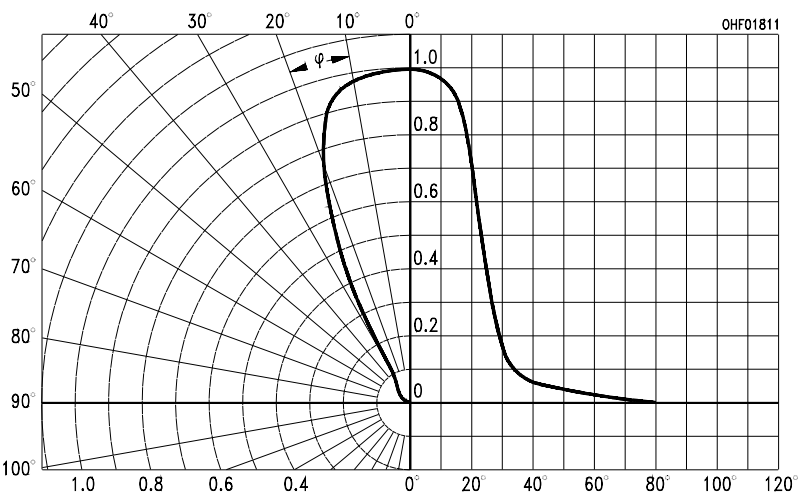
Bezeichnung Parameter	Symbol Symbol	Wert Value				Einheit Unit
		-1	-2	-3	-4	
Fotostrom, $\lambda = 950$ nm Photocurrent E_e = 0.5 mW/cm², V_{CE} = 5 V	I_{PCE}	0.4 … 0.8	0.63 … 1.25	1.0 … 2.0	≥ 1.6	mA
SFH 310: E_v = 1000 lx, Normlicht/ standard light A, V_{CE} = 5 V	I_{PCE}	2.1	3.4	5.4	8.6	mA
Anstiegszeit/Abfallzeit Rise and fall time I_C = 1 mA, V_{CC} = 5 V, R_L = 1 kΩ	t_r, t_f	5	7	8	12	µs
Kollektor-Emitter-Sättigungsspannung Collector-emitter saturation voltage $I_C = I_{PCEmin}$ [1] × 0.3, 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.

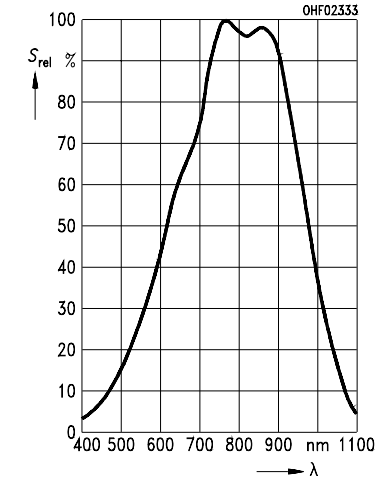
Directional Characteristics

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

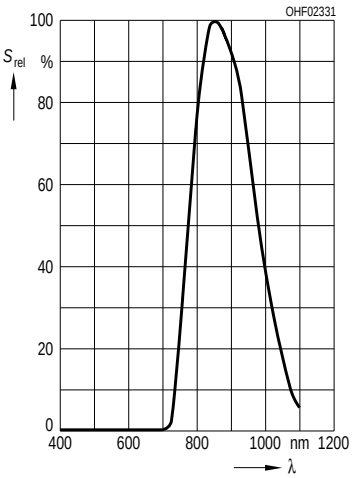


T_A = 25 °C, λ = 950 nm

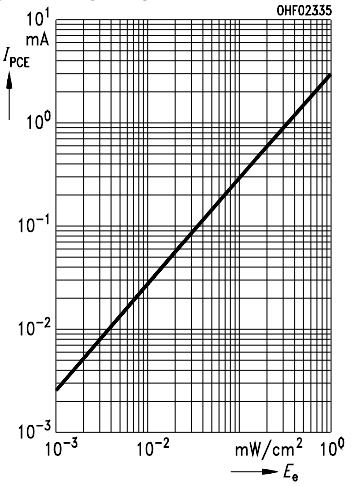
Relative Spectral Sensitivity, SFH 310 $S_{rel} = f(\lambda)$



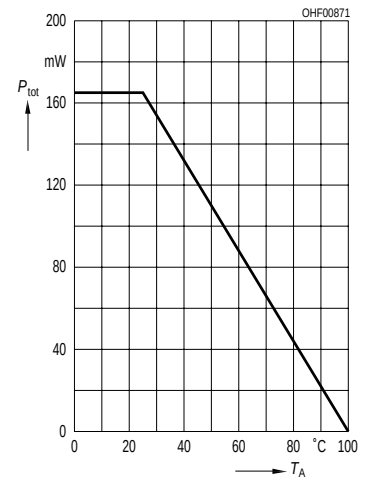
Relative Spectral Sensitivity, SFH 310 FA $S_{rel} = f(\lambda)$



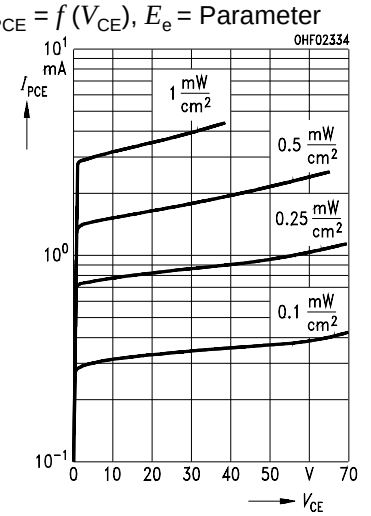
Photocurrent
$I_{PCE} = f(E_e)$, V_{CE} = 5 V



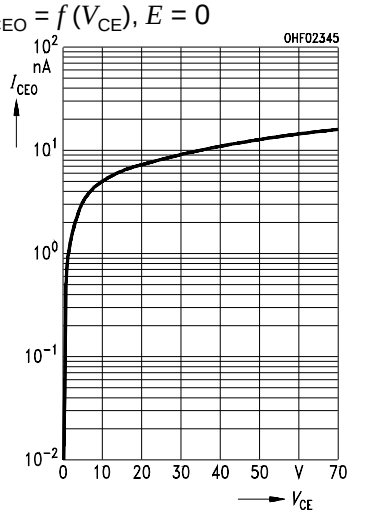
Total Power Dissipation
$P_{tot} = f(T_A)$



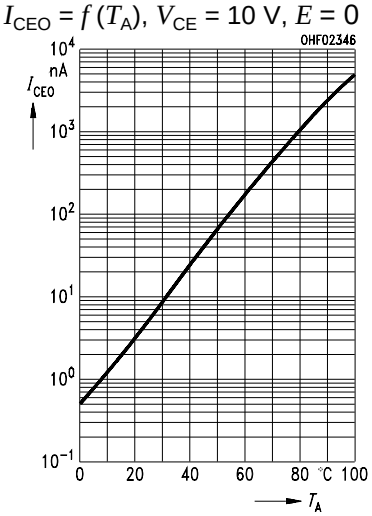
Photocurrent
$I_{PCE} = f(V_{CE})$, E_e = Parameter



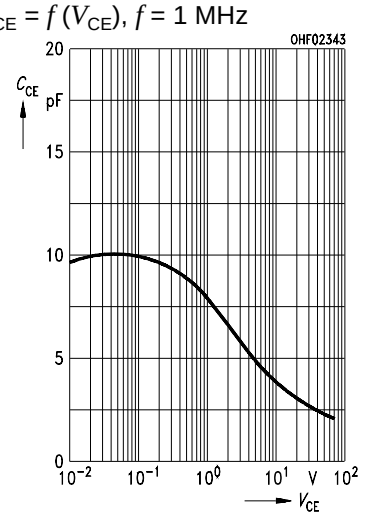
Dark Current
$I_{CEO} = f(V_{CE})$, E = 0



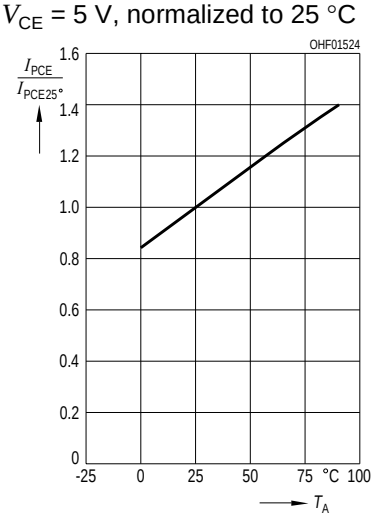
Dark Current
$I_{CEO} = f(T_A)$, V_{CE} = 10 V, E = 0



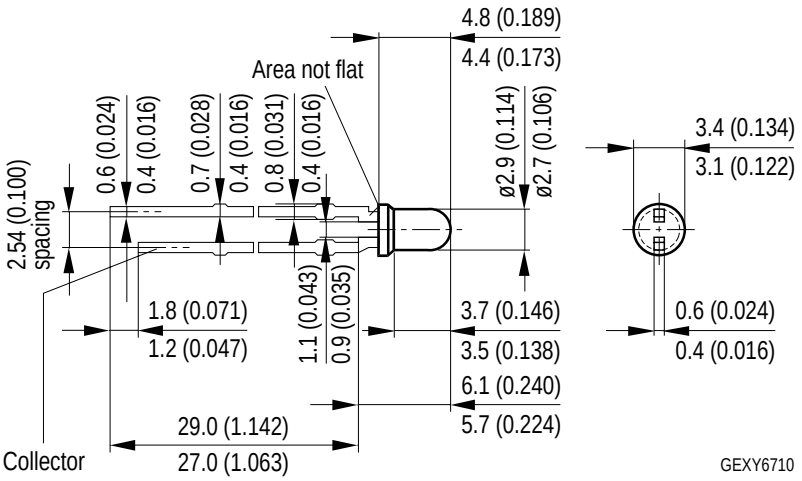
Capacitance
$C_{CE} = f(V_{CE})$, f = 1 MHz



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



Maßzeichnung
Package Outlines



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

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