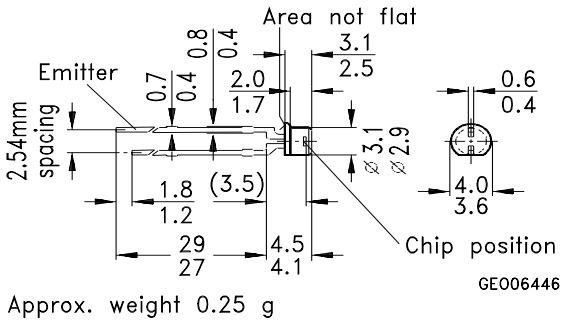
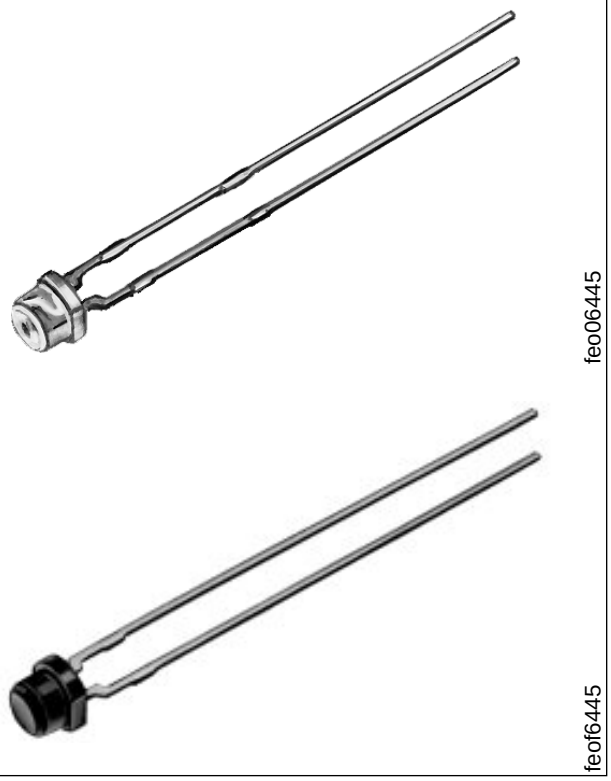
SIEMENS

NPN-Silizium-Fototransistor
Silicon NPN Phototransistor

SFH 309 P
SFH 309 PFA





Maße in mm, wenn nicht anders angegeben/Dimensions in mm, unless otherwise specified

Wesentliche Merkmale

- Speziell geeignet für Anwendungen im Bereich von 380 nm bis 1180 nm (SFH 309 P) und bei 880 nm (SFH 309 PFA)
- Hohe Linearität
- 3 mm plane Plastikbauform im LED-Gehäuse
- Gruppiert lieferbar

Features

- Especially suitable for applications from 380 nm to 1180 nm (SFH 309 P) and of 880 nm (SFH 309 PFA)
- High linearity
- 3 mm plane LED plastic package
- Available in groups

Anwendungen

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

Applications

- Photointerrupters
- Industrial electronics
- For control and drive circuits

Typ (*vorher) Type (*formerly)	Bestellnummer Ordering Code
SFH 309 P	Q62702-P245
SFH 309 PFA (*SFH 309 PF)	Q62702-P246

Grenzwerte
Maximum Ratings

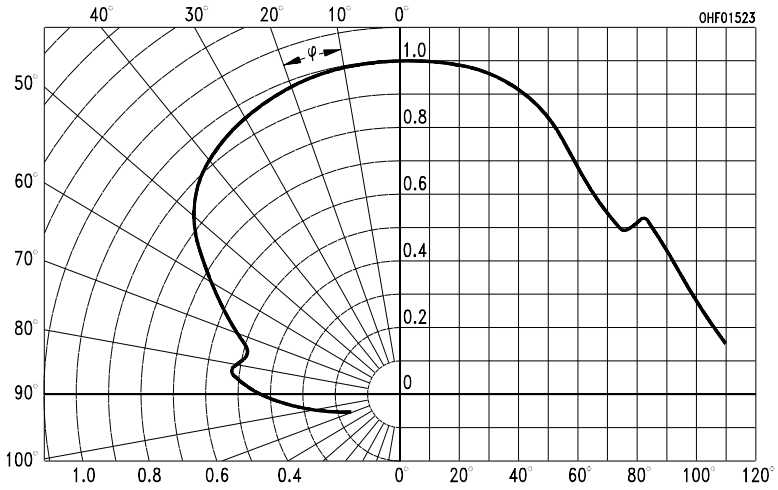
Bezeichnung **Description**	**Symbol** **Symbol**	**Wert** **Value**	**Einheit** **Unit**
Betriebs- und Lagertemperatur Operating and storage temperature range	T_{op}; T_{stg}	– 55 ... + 100	°C
Löttemperatur bei Tauchlötung Lötstelle ≥ 2 mm vom Gehäuse, Lötzeit $t \leq 5$ s Dip soldering temperature ≥ 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}	35	V
Kollektorstrom Collector current	I_C	15	mA
Kollektorspitzenstrom, $\tau < 10$ µs Collector surge current	I_{CS}	75	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

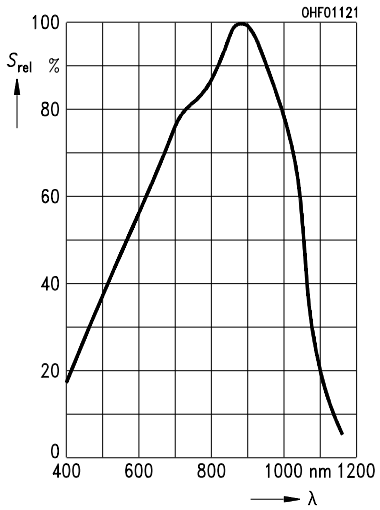
Bezeichnung **Description**	**Symbol** **Symbol**	**Wert** **Value**		**Einheit** **Unit**
		SFH 309 P	**SFH 309 PFA**	
Wellenlänge der max. Fotoempfindlichkeit Wavelength of max. sensitivity	$\lambda_{S\ max}$	860	900	nm
Spektraler Bereich der Fotoempfindlichkeit S = 10 % von S_{max} Spectral range of sensitivity S = 10 % of S_{max}	λ	380 ... 1180	730 ... 1120	nm
Bestrahlungsempfindliche Fläche (∅ 240 µm) Radiant sensitive area	A	0.045	0.045	mm^2
Abmessung der Chipfläche Dimensions of chip area	$L \times B$ $L \times W$	0.45 × 0.45	0.45 × 0.45	mm × mm
Abstand Chipoberfläche zu Gehäuseoberfläche Distance chip front to case surface	H	0.4 ... 0.8	0.4 ... 0.8	mm
Halbwinkel Half angle	φ	± 75	± 75	Grad deg.
Kapazität, V_{CE} = 0 V, f = 1 MHz, E = 0 Capacitance	C_{CE}	5.0	5.0	pF
Dunkelstrom Dark current V_{CE} = 25 V, E = 0	I_{CEO}	1 (≤ 200)	1 (≤ 200)	nA

Bezeichnung Description	Symbol Symbol	Wert Value	Einheit Unit
Fotostrom, $\lambda = 950$ nm Photocurrent E_e = 0.5 mW/cm^2, V_{CE} = 5 V	I_{PCE}	≥ 63	µA
SFH 309 P: E_v = 1000 lx, Normlicht/standard light A, V_{CE} = 5 V	I_{PCE}	420	µA
Anstiegszeit/Abfallzeit Rise and fall time I_C = 1 mA, V_{CC} = 5 V, R_L = 1 kΩ	t_r, t_f	≥ 6	µs
Kollektor-Emitter-Sättigungsspannung Collector-emitter saturation voltage I_C = 20 µA , E_e = 0.5 mW/cm^2	V_{CEsat}	150	mV

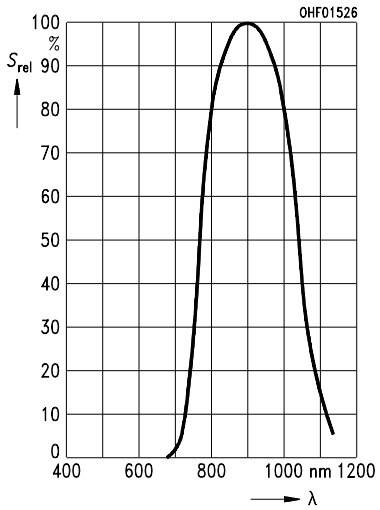
Directional characteristics $S_{rel} = f\ (\varphi)$



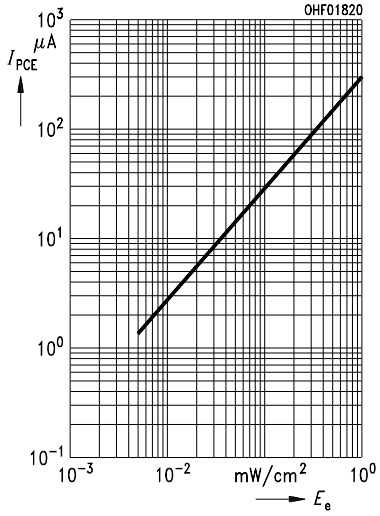
Relative spectral sensitivity,
SFH 309 P $S_{rel} = f\ (\lambda)$



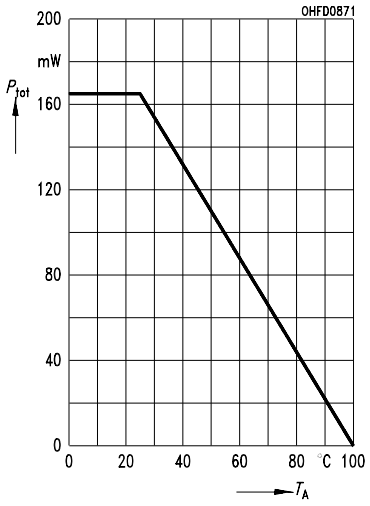
Relative spectral sensitivity,
SFH 309 PFA $S_{rel} = f\ (\lambda)$



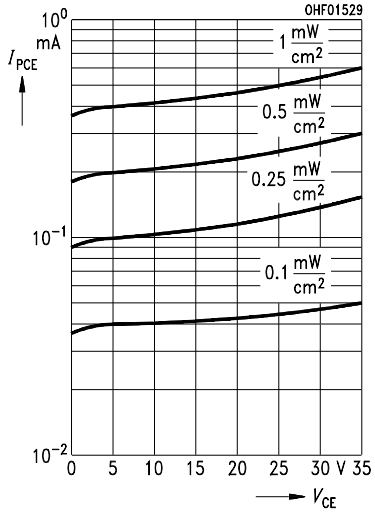
Photocurrent
$I_{PCE} = f\ (E_e)$, V_{CE} = 5 V



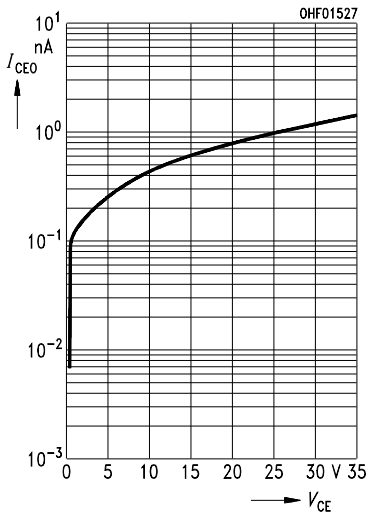
Total power dissipation
$P_{tot} = f\ (T_A)$



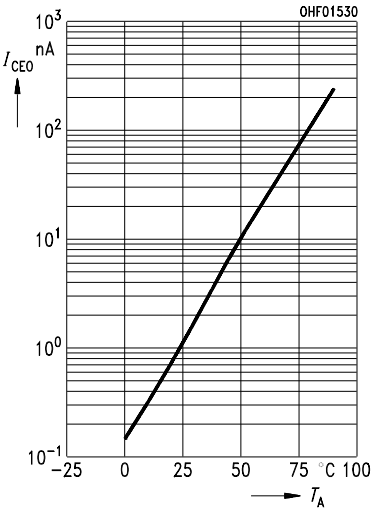
Photocurrent
$I_{PCE} = f\ (V_{CE})$, E_e = Parameter



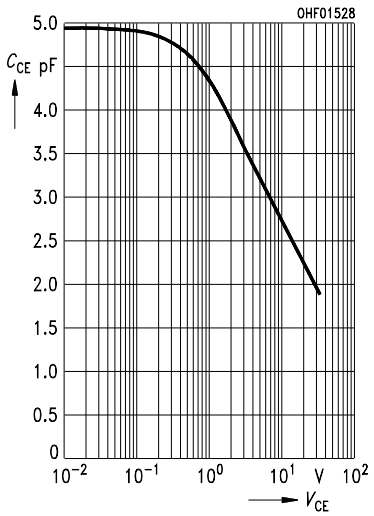
Dark current
$I_{CEO} = f\ (V_{CE})$, E = 0



Dark current
$I_{CEO} = f\ (T_A)$, V_{CE} = 25 V, E = 0



Capacitance
$C_{CE} = f\ (V_{CE})$, f = 1 MHz, E = 0



Photocurrent
$I_{PCE}/I_{PCE25^\circ} = f\ (T_A)$, V_{CE} = 5 V

