

Silizium-PIN-Fotodiode mit sehr kurzer Schaltzeit

Silicon PIN Photodiode with Very Short Switching Time

SFH 203 P

SFH 203 PFA



SFH 203 P



SFH 203 PFA

Wesentliche Merkmale

- Speziell geeignet für Anwendungen im Bereich von 400 nm bis 1100 nm (SFH 203 P) und bei 880 nm (SFH 203 PFA)
- Kurze Schaltzeit (typ. 5 ns)
- 5 mm-Plastikbauform im LED-Gehäuse

Anwendungen

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

Features

- Especially suitable for applications from 400 nm to 1100 nm (SFH 203 P) and of 880 nm (SFH 203 PFA)
- Short switching time (typ. 5 ns)
- 5 mm LED plastic package

Applications

- Industrial electronics
- For control and drive circuits
- Photointerrupters
- Fiber optic transmission systems

Typ Type	Bestellnummer Ordering Code
SFH 203 P	Q62702-P942
SFH 203 PFA	Q62702-P947

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 (Lötstelle 2 mm vom Gehäuse entfernt bei Lötzeit $t \leq 3$ s) Soldering temperature in 2 mm distance from case bottom ($t \leq 3$ s)	T_S	300	°C
Sperrspannung Reverse voltage	V_R	50	V
Verlustleistung Total power dissipation	P_{tot}	100	mW

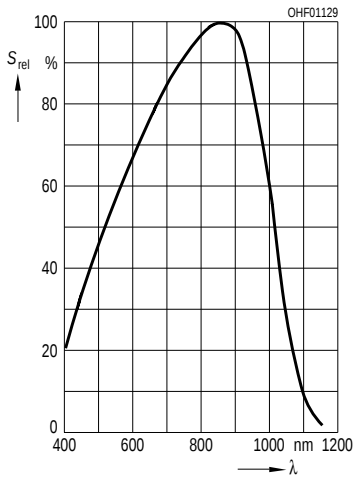
Kennwerte ($T_A = 25$ °C)
Characteristics

Bezeichnung Parameter	Symbol Symbol	Wert Value		Einheit Unit
		SFH 203 P	SFH 203 PFA	
Fotostrom Photocurrent $V_R = 5$ V, Normlicht/standard light A, $T = 2856$ K, $E_V = 1000$ lx $V_R = 5$ V, $\lambda = 950$ nm, $E_e = 1$ mW/cm ²	I_P I_P	9.5 (≥ 5) –	– 6.2 (≥ 3.6)	μ A μ A
Wellenlänge der max. Fotoempfindlichkeit Wavelength of max. sensitivity	$\lambda_{S\ max}$	850	900	nm
Spektraler Bereich der Fotoempfindlichkeit $S = 10$ % von S_{max} Spectral range of sensitivity $S = 10$ % of S_{max}	λ	400 ... 1100	750 ... 1100	nm
Bestrahlungsempfindliche Fläche Radiant sensitive area	A	1	1	mm ²
Abmessung der bestrahlungsempfindlichen Fläche Dimensions of radiant sensitive area	$L \times B$ $L \times W$	1 × 1	1 × 1	mm × mm
Halbwinkel Half angle	φ	± 75	± 75	Grad deg.
Dunkelstrom, $V_R = 20$ V Dark current	I_R	1 (≤ 10)	1 (≤ 10)	nA

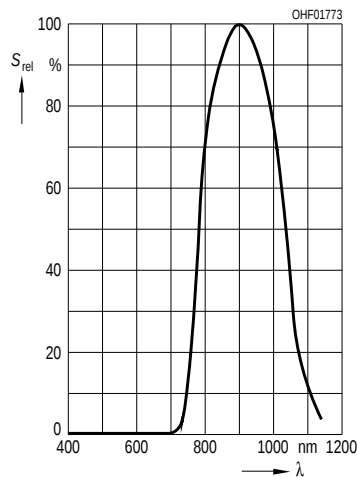
Kennwerte ($T_A = 25\text{ °C}$)**Characteristics** (cont'd)

Bezeichnung Parameter	Symbol Symbol	Wert Value		Einheit Unit
		SFH 203 P	SFH 203 PFA	
Spektrale Fotoempfindlichkeit, $\lambda = 850\text{ nm}$ Spectral sensitivity	S_λ	0.62	0.59	A/W
Quantenausbeute, $\lambda = 850\text{ nm}$ Quantum yield	η	0.89	0.86	<u>Electrons</u> Photon
Leerlaufspannung Open-circuit voltage $E_v = 1000\text{ lx}$, Normlicht/standard light A, $T = 2856\text{ K}$ $E_e = 0.5\text{ mW/cm}^2$, $\lambda = 950\text{ nm}$	V_O V_O	350 (≥ 300) –	– 300 (≥ 250)	mV mV
Kurzschlußstrom Short-circuit current $E_v = 1000\text{ lx}$, Normlicht/standard light A, $T = 2856\text{ K}$ $E_e = 0.5\text{ mW/cm}^2$, $\lambda = 950\text{ nm}$	I_{SC} I_{SC}	9.3 –	– 3.0	μA μA
Anstiegs- und Abfallzeit des Fotostromes Rise and fall time of the photocurrent $R_L = 50\text{ }\Omega$; $V_R = 20\text{ V}$; $\lambda = 850\text{ nm}$; $I_p = 800\text{ }\mu\text{A}$	t_r, t_f	5	5	ns
Durchlaßspannung, $I_F = 80\text{ mA}$, $E = 0$ Forward voltage	V_F	1.3	1.3	V
Kapazität, $V_R = 0\text{ V}$, $f = 1\text{ MHz}$, $E = 0$ Capacitance	C_0	11	11	pF
Temperaturkoeffizient von V_O Temperature coefficient of V_O	TC_V	– 2.6	– 2.6	mV/K
Temperaturkoeffizient von I_{SC} Temperature coefficient of I_{SC} Normlicht/standard light A $\lambda = 950\text{ nm}$	TC_I	0.18 –	– 0.2	%/K
Rauschäquivalente Strahlungsleistung Noise equivalent power $V_R = 20\text{ V}$, $\lambda = 850\text{ nm}$	NEP	2.9×10^{-14}	2.9×10^{-14}	$\frac{\text{W}}{\sqrt{\text{Hz}}}$
Nachweisgrenze, $V_R = 20\text{ V}$, $\lambda = 850\text{ nm}$ Detection limit	D^*	3.5×10^{12}	3.5×10^{12}	$\frac{\text{cm} \times \sqrt{\text{Hz}}}{\text{W}}$

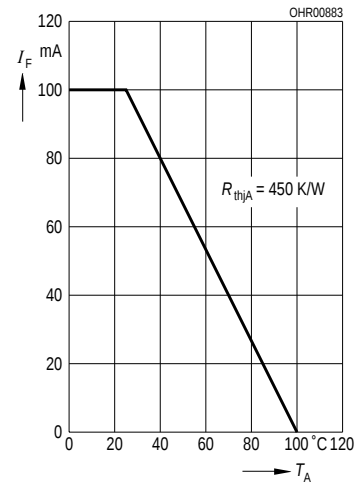
Relative Spectral Sensitivity
SFH 203 P, $S_{rel} = f(\lambda)$



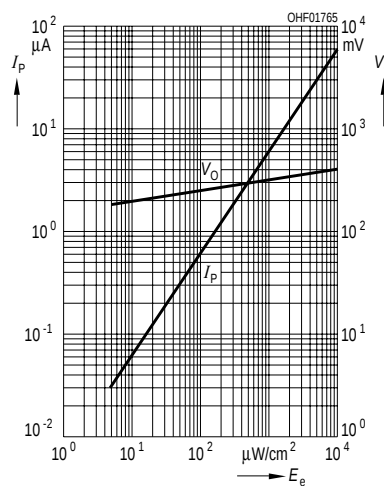
Relative Spectr. Sensitivity
SFH 203 PFA, $S_{rel} = f(\lambda)$



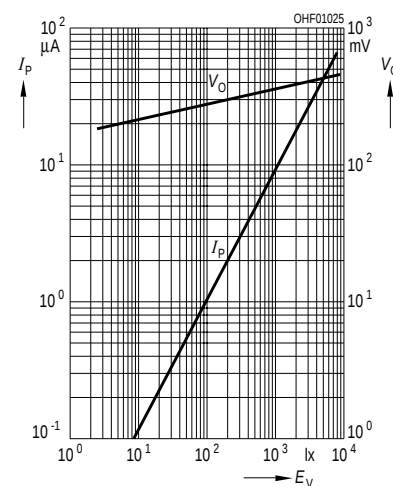
Total Power Dissipation
 $P_{tot} = f(T_A)$



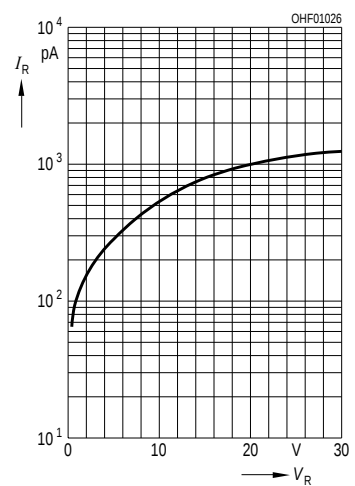
Photocurrent $I_P = f(E_e)$, $V_R = 5 V$
Open-Circuit Voltage $V_O = f(E_e)$
SFH 203 PFA



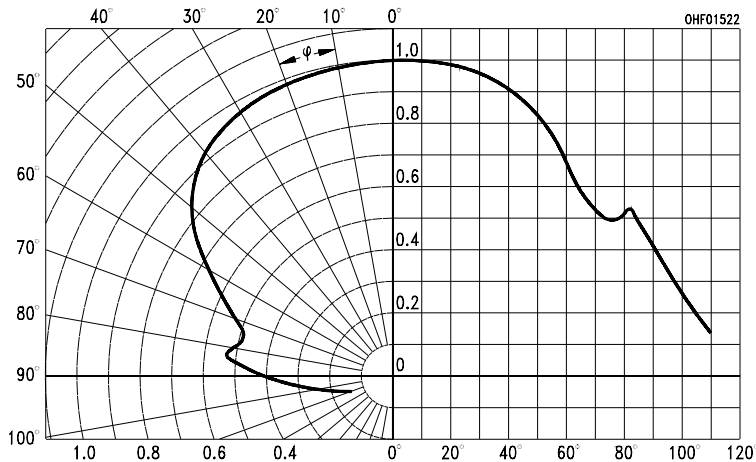
Photocurrent $I_P = f(E_v)$, $V_R = 5 V$
Open-Circuit Voltage $V_O = f(E_v)$
SFH 203 P



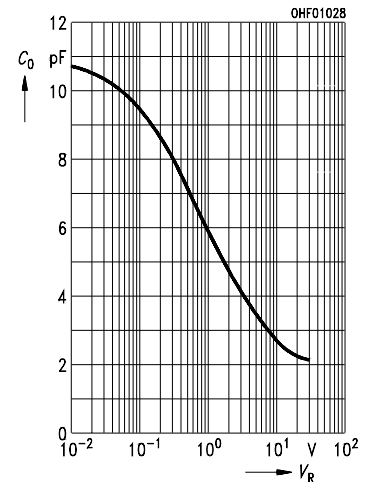
Dark Current
 $I_R = f(V_R)$, $E = 0$



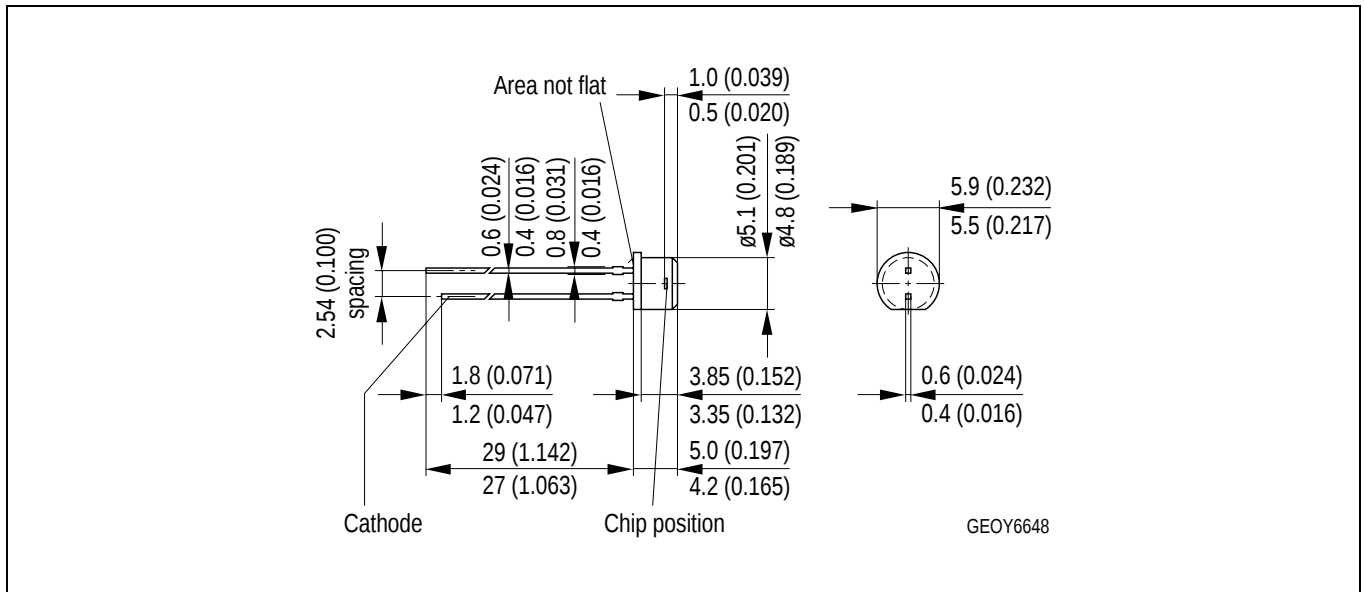
Directional Characteristics
 $S_{rel} = f(\varphi)$



Capacitance
 $C = f(V_R)$, $f = 1 MHz$, $E = 0$



Maßzeichnung Package Outlines



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

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