

Silizium-PIN-Fotodiode mit sehr kurzer Schaltzeit

Silicon PIN Photodiode with Very Short Switching Time

Lead (Pb) Free Product - RoHS Compliant

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	Q62702P0942
SFH 203 PFA	Q62702P0947

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
Sperrspannung Reverse voltage	V_R	50	V
Verlustleistung Total power dissipation	P_{tot}	150	mW

Kennwerte ($T_A = 25\text{ °C}$)
Characteristics

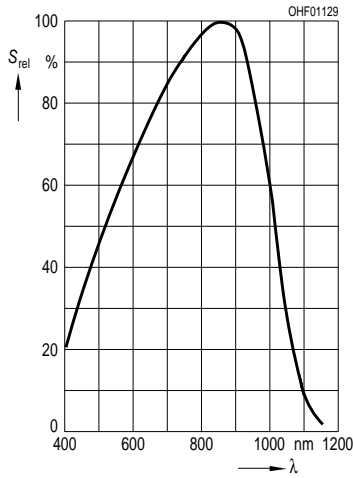
Bezeichnung Parameter	Symbol Symbol	Wert Value		Einheit Unit
		SFH 203 P	SFH 203 PFA	
Fotostrom Photocurrent $V_R = 5\text{ V}$, Normlicht/standard light A, $T = 2856\text{ K}$, $E_V = 1000\text{ lx}$ $V_R = 5\text{ V}$, $\lambda = 950\text{ nm}$, $E_e = 1\text{ mW/cm}^2$	I_P	9.5 (≥ 5)	–	μA
	I_P	–	6.2 (≥ 3.6)	μA
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, $V_R = 20\text{ V}$ Dark current	I_R	1 (≤ 10)	1 (≤ 10)	nA
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

Kennwerte ($T_A = 25\text{ °C}$)

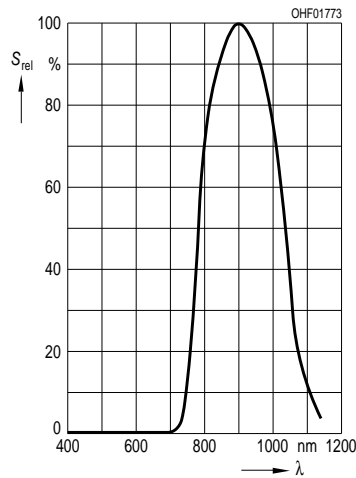
Characteristics (cont'd)

Bezeichnung Parameter	Symbol Symbol	Wert Value		Einheit Unit
		SFH 203 P	SFH 203 PFA	
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	350 (≥ 300)	–	mV
	V_O	–	300 (≥ 250)	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}	9.3	–	μA
	I_{SC}	–	3.0	μA
Anstiegs- und Abfallzeit des Fotostromes Rise and fall time of the photocurrent $R_L = 50\ \Omega$; $V_R = 20\text{ V}$; $\lambda = 850\text{ nm}$; $I_p = 800\ \mu\text{A}$	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}	$\frac{\text{cm} \times \sqrt{\text{Hz}}}{\text{W}}$

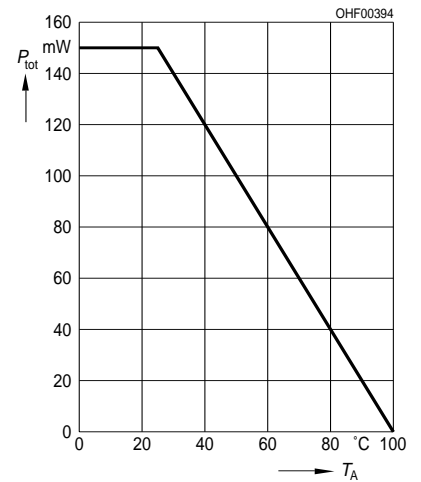
Relative Spectral Sensitivity
SFH 203 P, $S_{rel} = f(\lambda)$



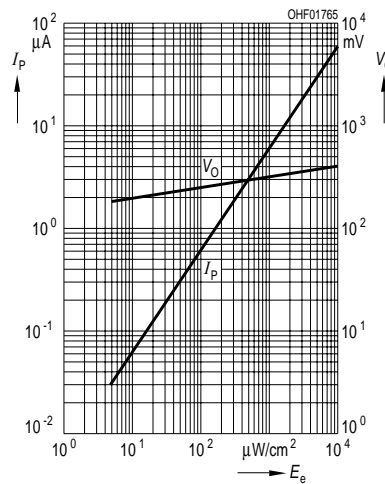
Relative Spectr. Sensitivity
SFH 203 PFA, $S_{rel} = f(\lambda)$



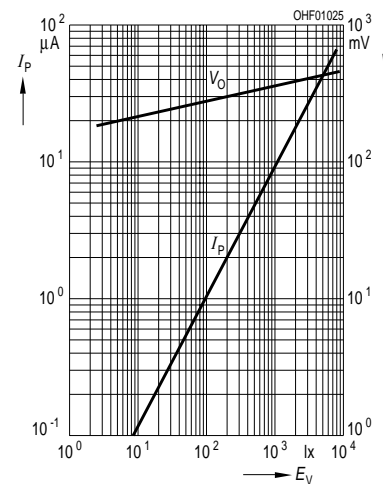
Total Power Dissipation
 $P_{tot} = f(T_A)$



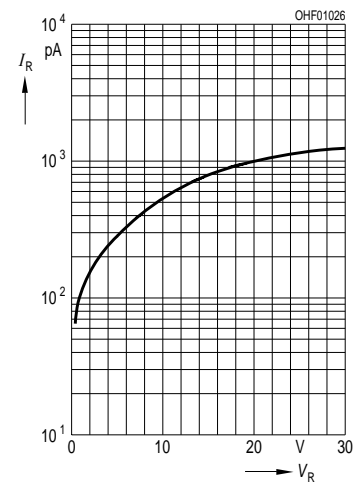
Photocurrent $I_P = f(E_e)$, $V_R = 5 V$
Open-Circuit Voltage $V_O = f(E_e)$
SFH 203 PFA



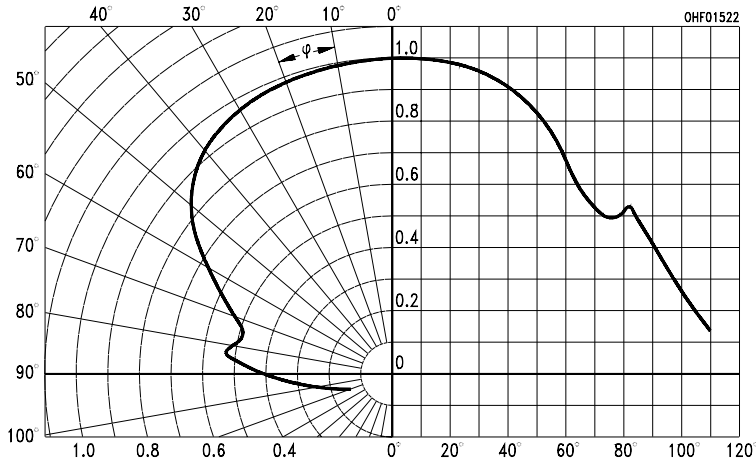
Photocurrent $I_P = f(E_v)$, $V_R = 5 V$
Open-Circuit Voltage $V_O = f(E_v)$
SFH 203 P



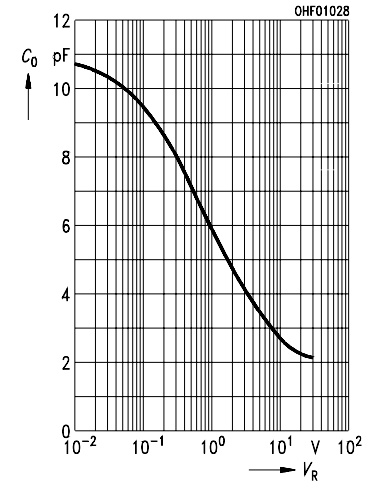
Dark Current
 $I_R = f(V_R), E = 0$



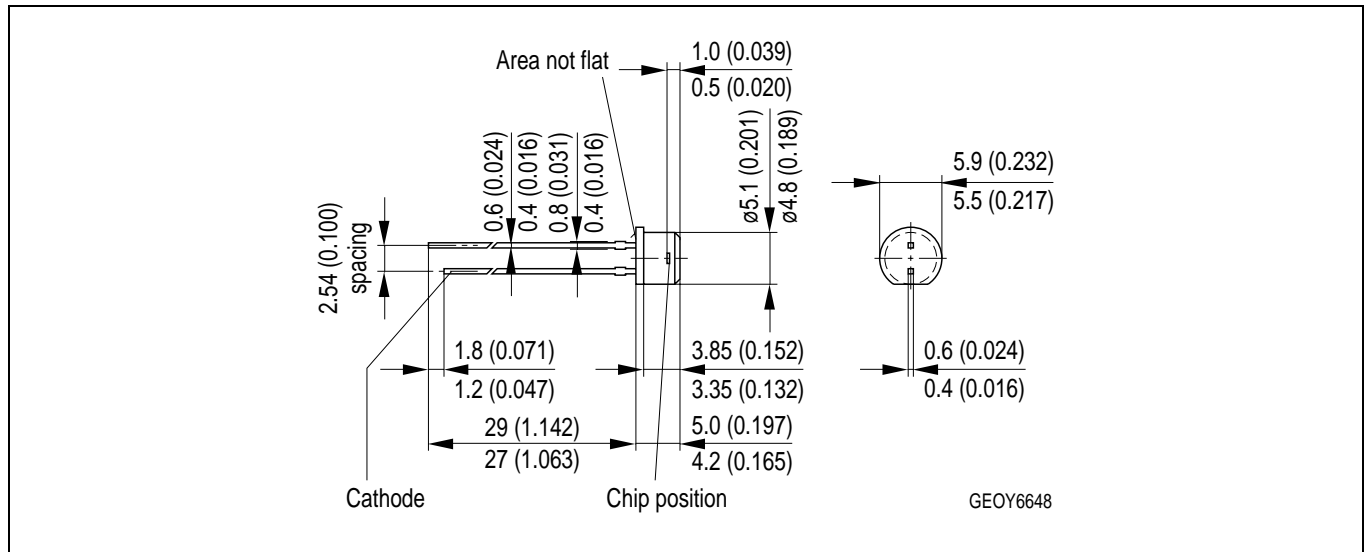
Directional Characteristics
 $S_{rel} = f(\varphi)$



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



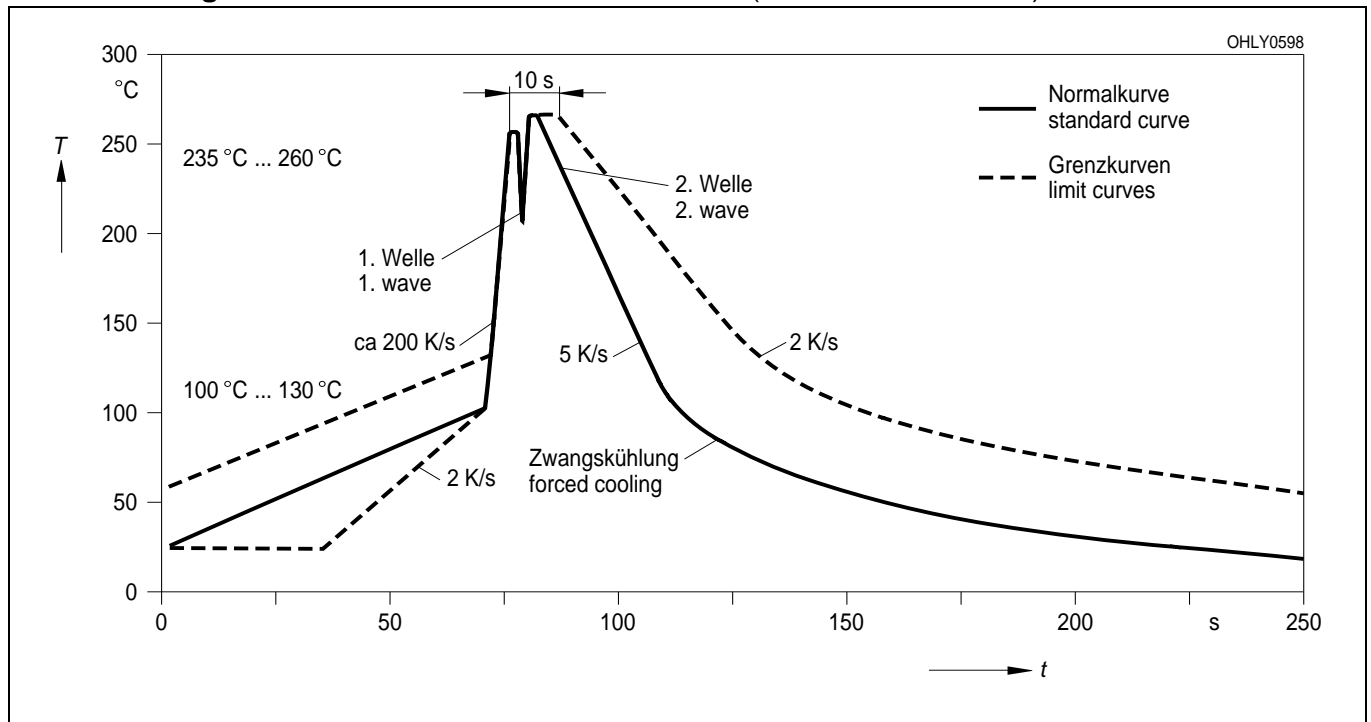
**Maßzeichnung
Package Outlines**



Maße 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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EU RoHS and China RoHS compliant product



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