

**Silizium-PIN-Fotodiode mit sehr kurzer Schaltzeit**  
**Silicon PIN Photodiode with Very Short Switching Time**  
**Lead (Pb) Free Product - RoHS Compliant**

**SFH 203**  
**SFH 203 FA**



SFH 203



SFH 203 FA

**Wesentliche Merkmale**

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

**Features**

- Especially suitable for applications from 400 nm to 1100 nm (SFH 203) and of 880 nm (SFH 203 FA)
- Short switching time (typ. 5 ns)
- 5 mm LED plastic package
- Also available on tape and reel

**Anwendungen**

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

**Applications**

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

Typ Type	Bestellnummer Ordering Code
SFH 203	Q62702P0955
SFH 203 FA	Q62702P0956

**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	SFH 203 FA	
Fotostrom Photocurrent $V_R = 5\text{ V}$ , Normlicht/standard light A, $T = 2856\text{ K}$ , $E_V = 1000\text{ lx}$ $V_R = 5\text{ V}$ , $\lambda = 950\text{ nm}$ , $E_e = 1\text{ mW/cm}^2$	$I_P$	80 ( $\geq 50$ )	–	$\mu\text{A}$
	$I_P$	–	50 ( $\geq 30$ )	$\mu\text{A}$
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 $S_{\max}$	$\lambda$	400 ... 1100	800 ... 1100	nm
Bestrahlungsempfindliche Fläche Radiant sensitive area	$A$	1	1	$\text{mm}^2$
Abmessung der bestrahlungsempfindlichen Fläche Dimensions of radiant sensitive area	$L \times B$ $L \times W$	$1 \times 1$	$1 \times 1$	mm × m m
Halbwinkel Half angle	$\varphi$	$\pm 20$	$\pm 20$	Grad deg.
Dunkelstrom, $V_R = 20\text{ V}$ Dark current	$I_R$	1 ( $\leq 5$ )	1 ( $\leq 5$ )	nA
Spektrale Fotoempfindlichkeit, $\lambda = 850\text{ nm}$ Spectral sensitivity	$S_\lambda$	0.62	0.59	A/W
Quantenausbeute, $\lambda = 850\text{ nm}$ Quantum yield	$\eta$	0.89	0.86	<u>Electrons</u> Photon

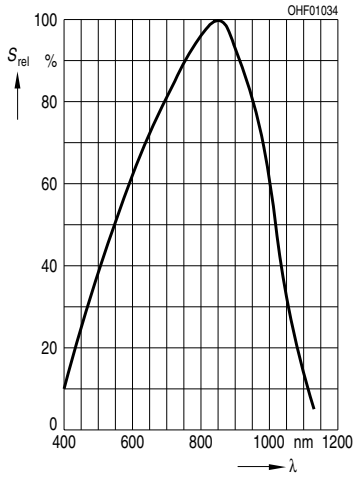
Kennwerte ( $T_A = 25 \text{ }^\circ\text{C}$ )

## Characteristics (cont'd)

Bezeichnung Parameter	Symbol Symbol	Wert Value		Einheit Unit
		SFH 203	SFH 203 FA	
Leerlaufspannung Open-circuit voltage $E_v = 1000 \text{ lx}$ , Normlicht/standard light A, $T = 2856 \text{ K}$ $E_e = 0.5 \text{ mW/cm}^2$ , $\lambda = 950 \text{ nm}$	$V_O$	420 ( $\geq 350$ )	–	mV
	$V_O$	–	370 ( $\geq 300$ )	mV
Kurzschlußstrom Short-circuit current $E_v = 1000 \text{ lx}$ , Normlicht/standard light A, $T = 2856 \text{ K}$ $E_e = 0.5 \text{ mW/cm}^2$ , $\lambda = 950 \text{ nm}$	$I_{SC}$	80	–	$\mu\text{A}$
	$I_{SC}$	–	25	$\mu\text{A}$
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 $V_R = 20 \text{ V}$ , $\lambda = 850 \text{ nm}$	$NEP$	$2.9 \times 10^{-14}$	$2.9 \times 10^{-14}$	$\frac{\text{W}}{\sqrt{\text{Hz}}}$
Nachweisgrenze, $V_R = 20 \text{ V}$ , $\lambda = 850 \text{ nm}$ Detection limit	$D^*$	$3.5 \times 10^{12}$	$3.5 \times 10^{12}$	$\frac{\text{cm} \times \sqrt{\text{Hz}}}{\text{W}}$

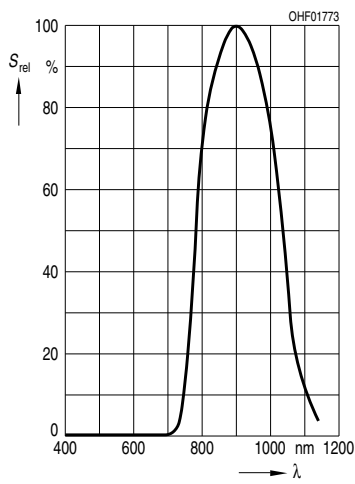
**Relative Spectral Sensitivity SFH 203**

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

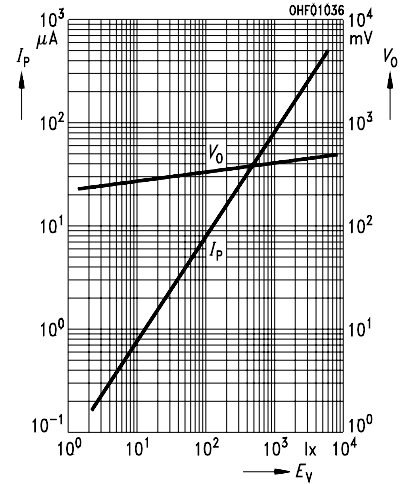


**Relative Spectral Sensitivity SFH 203 FA**

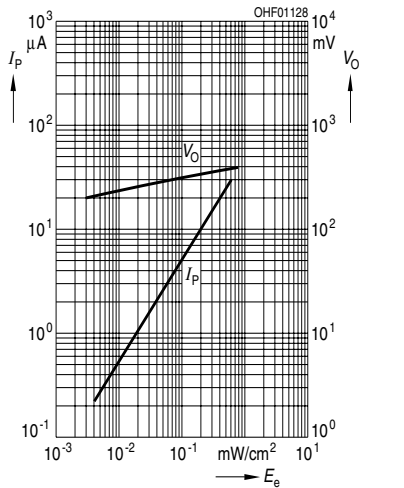
$S_{rel} = f(\lambda)$



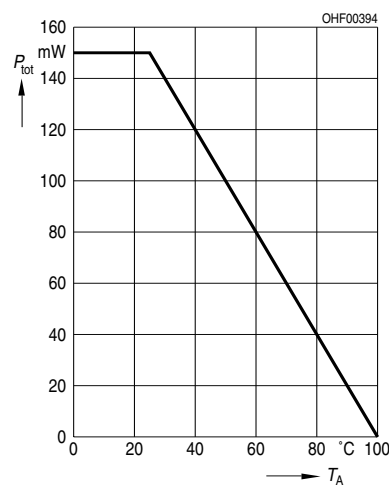
**Photocurrent  $I_P = f(E_v)$ ,  $V_R = 5 V$   
Open-Circuit Voltage  $V_O = f(E_v)$   
SFH 203**



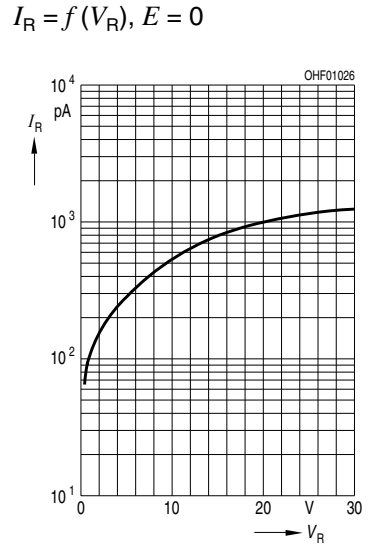
**Photocurrent  $I_P = f(E_e)$ ,  $V_R = 5 V$   
Open-Circuit-Voltage  $V_O = f(E_e)$   
SFH 203 FA**



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

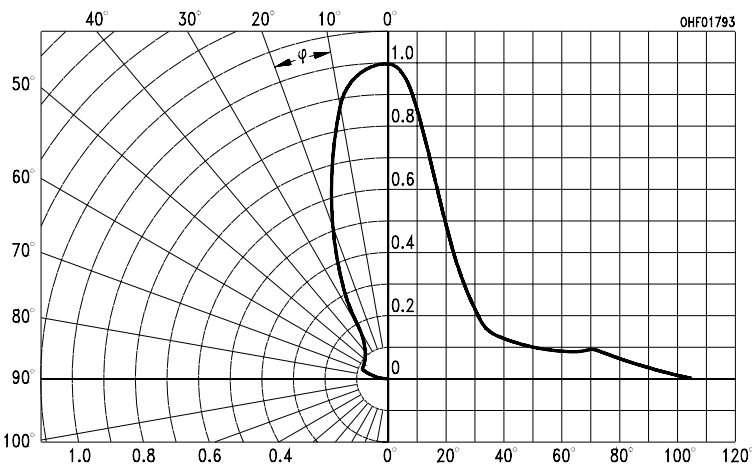


**Dark Current  $I_R = f(V_R), E = 0$**

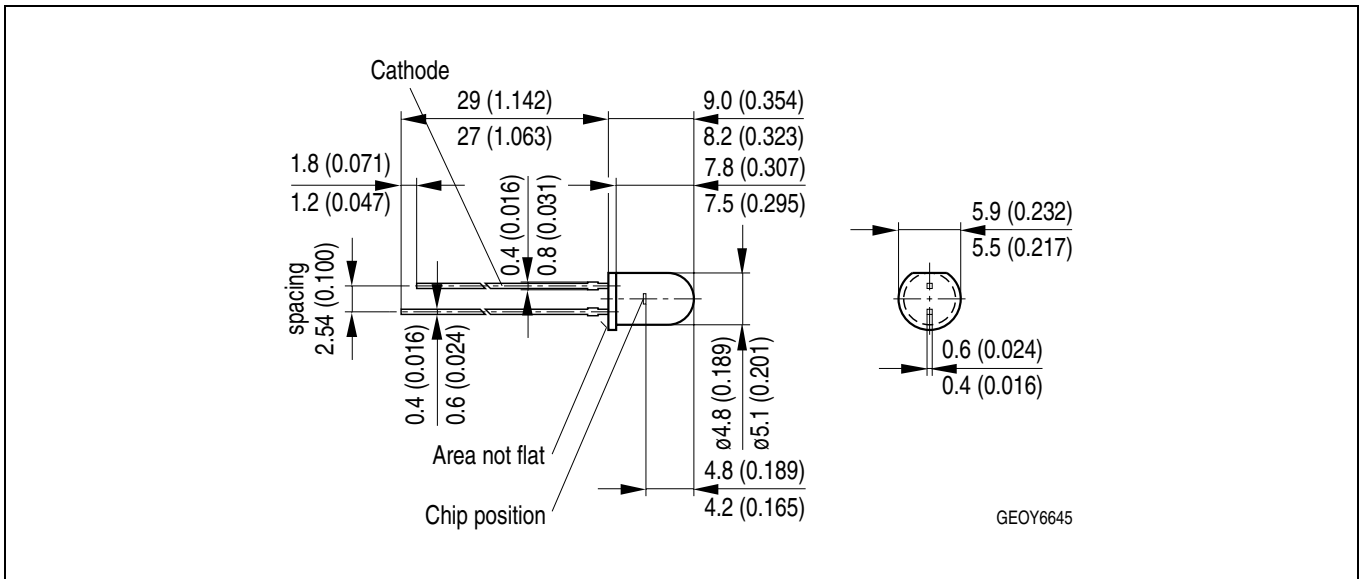


**Directional Characteristics  $S_{rel} = f(\varphi)$**

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



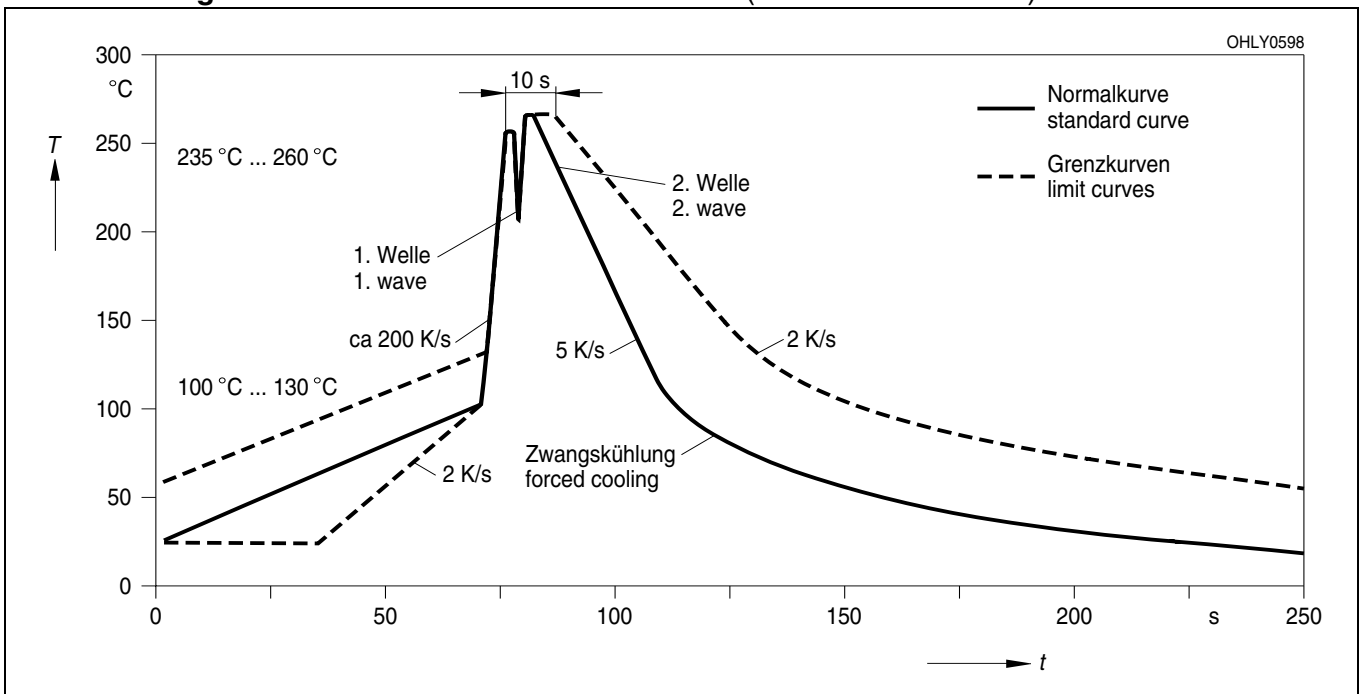
**Maßzeichnung  
Package Outlines**



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

**Lötbedingungen  
Soldering Conditions  
Wellenlöten (TTW)  
TTW Soldering**

(nach CECC 00802)  
(acc. to CECC 00802)



Published by  
OSRAM Opto Semiconductors GmbH  
Wernerwerkstrasse 2, D-93049 Regensburg  
[www.osram-os.com](http://www.osram-os.com)

© All Rights Reserved.

**Attention please!**

The information describes the type of component and shall not be considered as assured characteristics. Terms of delivery and rights to change design reserved. Due to technical requirements components may contain dangerous substances. For information on the types in question please contact our Sales Organization.

**Packing**

Please use the recycling operators known to you. We can also help you – get in touch with your nearest sales office. By agreement we will take packing material back, if it is sorted. You must bear the costs of transport. For packing material that is returned to us unsorted or which we are not obliged to accept, we shall have to invoice you for any costs incurred.

**Components used in life-support devices or systems must be expressly authorized for such purpose!** Critical components <sup>1</sup> may only be used in life-support devices or systems <sup>2</sup> with the express written approval of OSRAM OS.

<sup>1</sup> A critical component is a component used in a life-support device or system whose failure can reasonably be expected to cause the failure of that life-support device or system, or to affect its safety or effectiveness of that device or system.

<sup>2</sup> Life support devices or systems are intended (a) to be implanted in the human body, or (b) to support and/or maintain and sustain human life. If they fail, it is reasonable to assume that the health of the user may be endangered.