

Silizium-PIN-Fotodiode mit sehr kurzer Schaltzeit

Silicon PIN Photodiode with Very Short Switching Time

Lead (Pb) Free Product - RoHS Compliant

SFH 213 SFH 213 FA



SFH 213



SFH 213 FA

Wesentliche Merkmale

- Speziell geeignet für Anwendungen im Bereich von 400 nm bis 1100 nm (SFH 213) und bei 880 nm (SFH 213 FA)
- Kurze Schaltzeit (typ. 5 ns)
- 5 mm-Plastikbauform im LED-Gehäuse
- Auch gegutet lieferbar

Anwendungen

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

Features

- Especially suitable for applications from 400 nm to 1100 nm (SFH 213) and of 880 nm (SFH 213 FA)
- Short switching time (typ. 5 ns)
- 5 mm LED plastic package
- Also available on tape and reel

Applications

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

Typ Type	Bestellnummer Ordering Code
SFH 213	Q62702P0930
SFH 213 FA	Q62702P1671

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

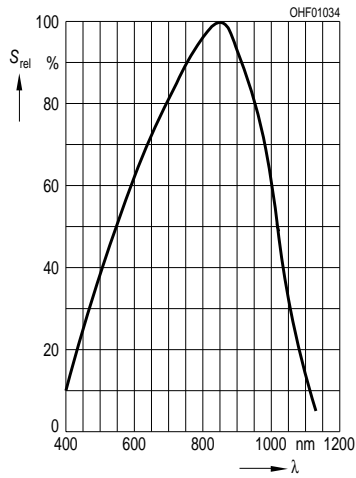
Kennwerte ($T_A = 25\text{ °C}$)
Characteristics

Bezeichnung Parameter	Symbol Symbol	Wert Value		Einheit Unit
		SFH 213	SFH 213 FA	
Fotostrom Photocurrent $V_R = 5\text{ V}$, Normlicht/standard light A, $T = 2856\text{ K}$, $E_V = 1000\text{ lx}$ $V_R = 5\text{ V}$, $\lambda = 870\text{ nm}$, $E_e = 1\text{ mW/cm}^2$	I_P	135 (≥ 100)	–	μA
	I_P	–	90 (≥ 65)	μA
Wellenlänge der max. Fotoempfindlichkeit Wavelength of max. sensitivity	$\lambda_{S\text{ max}}$	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	$\text{mm} \times \text{mm}$
Halbwinkel Half angle	φ	± 10	± 10	Grad deg.
Dunkelstrom, $V_R = 20\text{ V}$ Dark current	I_R	$1 (\leq 5)$	$1 (\leq 5)$	nA
Spektrale Fotoempfindlichkeit, $\lambda = 870\text{ nm}$ Spectral sensitivity	S_λ	0.62	0.59	A/W
Quantenausbeute, $\lambda = 870\text{ nm}$ Quantum yield	η	0.89	0.86	<u>Electrons</u> Photon

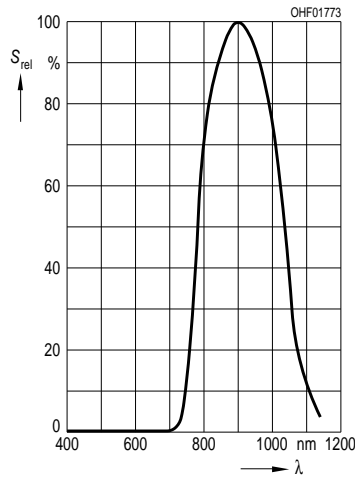
Kennwerte ($T_A = 25\text{ °C}$)
Characteristics (cont'd)

Bezeichnung Parameter	Symbol Symbol	Wert Value		Einheit Unit
		SFH 213	SFH 213 FA	
Leerlaufspannung Open-circuit voltage $E_V = 1000\text{ lx}$, Normlicht/standard light A, $T = 2856\text{ K}$ $E_e = 0.5\text{ mW/cm}^2$, $\lambda = 870\text{ nm}$	V_O	430 (≥ 350)	–	mV
	V_O	–	380 (≥ 300)	mV
Kurzschlußstrom Short-circuit current $E_V = 1000\text{ lx}$, Normlicht/standard light A, $T = 2856\text{ K}$ $E_e = 0.5\text{ mW/cm}^2$, $\lambda = 870\text{ nm}$	I_{SC}	125	–	μA
	I_{SC}	–	42	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 $\lambda = 870\text{ nm}$	TC_I	0.18 –	– 0.2	%/K
Rauschäquivalente Strahlungsleistung Noise equivalent power $V_R = 10\text{ V}$, $\lambda = 870\text{ nm}$	NEP	2.9×10^{-14}	2.9×10^{-14}	$\frac{\text{W}}{\sqrt{\text{Hz}}}$
Nachweisgrenze, $V_R = 20\text{ V}$, $\lambda = 870\text{ nm}$ Detection limit	D^*	3.5×10^{12}	3.5×10^{12}	$\frac{\text{cm} \times \sqrt{\text{Hz}}}{\text{W}}$

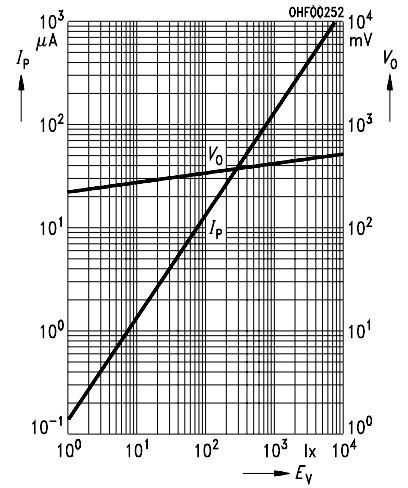
Relative Spectral Sensitivity
SFH 213, $S_{rel} = f(\lambda)$



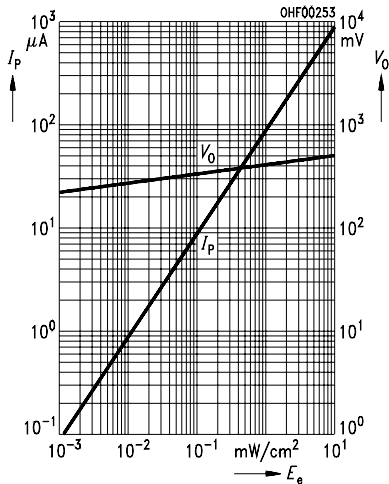
Relative Spectral Sensitivity
SFH 213 FA, $S_{rel} = f(\lambda)$



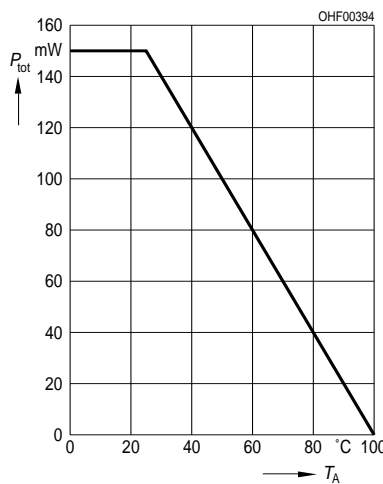
Photocurrent $I_P = f(E_v)$, $V_R = 5 V$
Open-Circuit Voltage $V_O = f(E_v)$
SFH 213



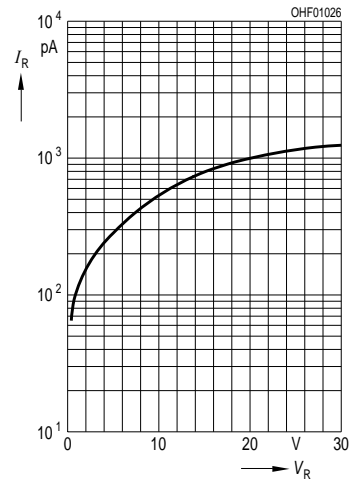
Photocurrent $I_P = f(E_e)$, $V_R = 5 V$
Open-Circuit Voltage $V_O = f(E_e)$
SFH 213 FA



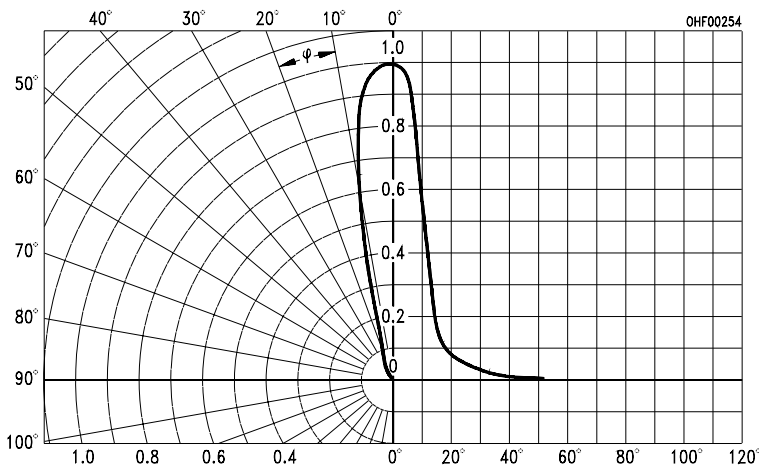
Total Power Dissipation
 $P_{tot} = f(T_A)$



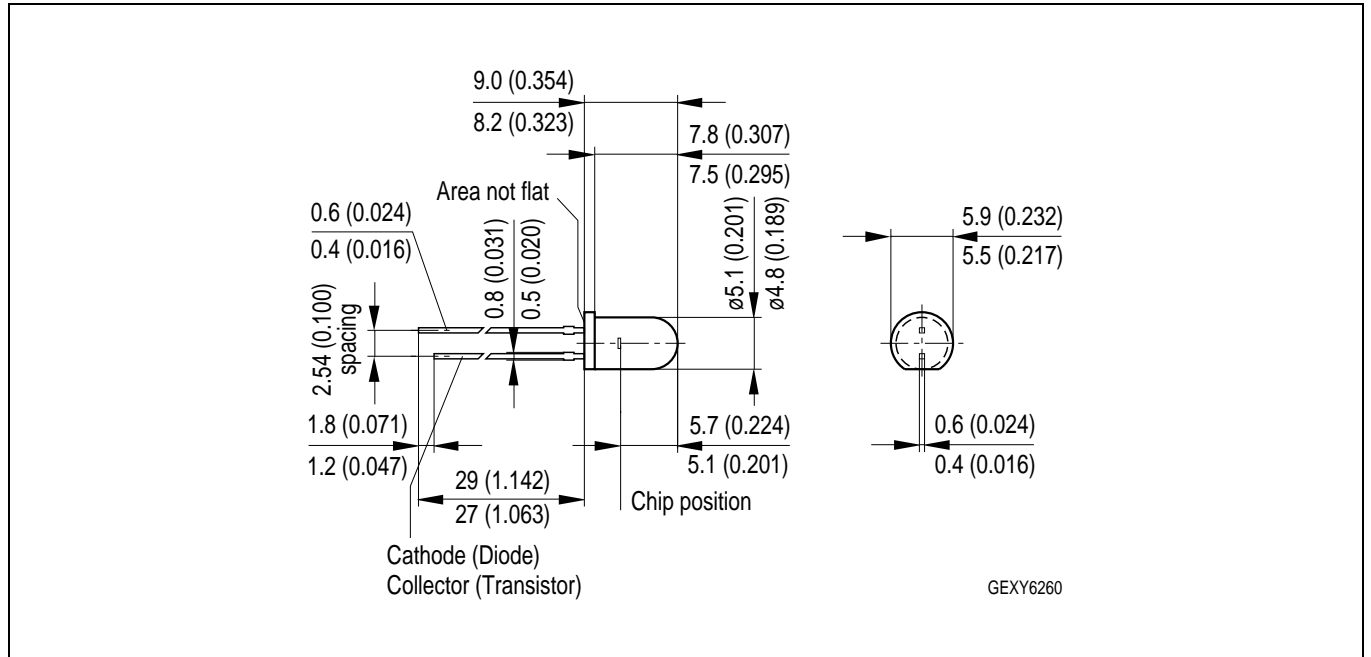
Dark Current
 $I_R = f(V_R), E = 0$



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



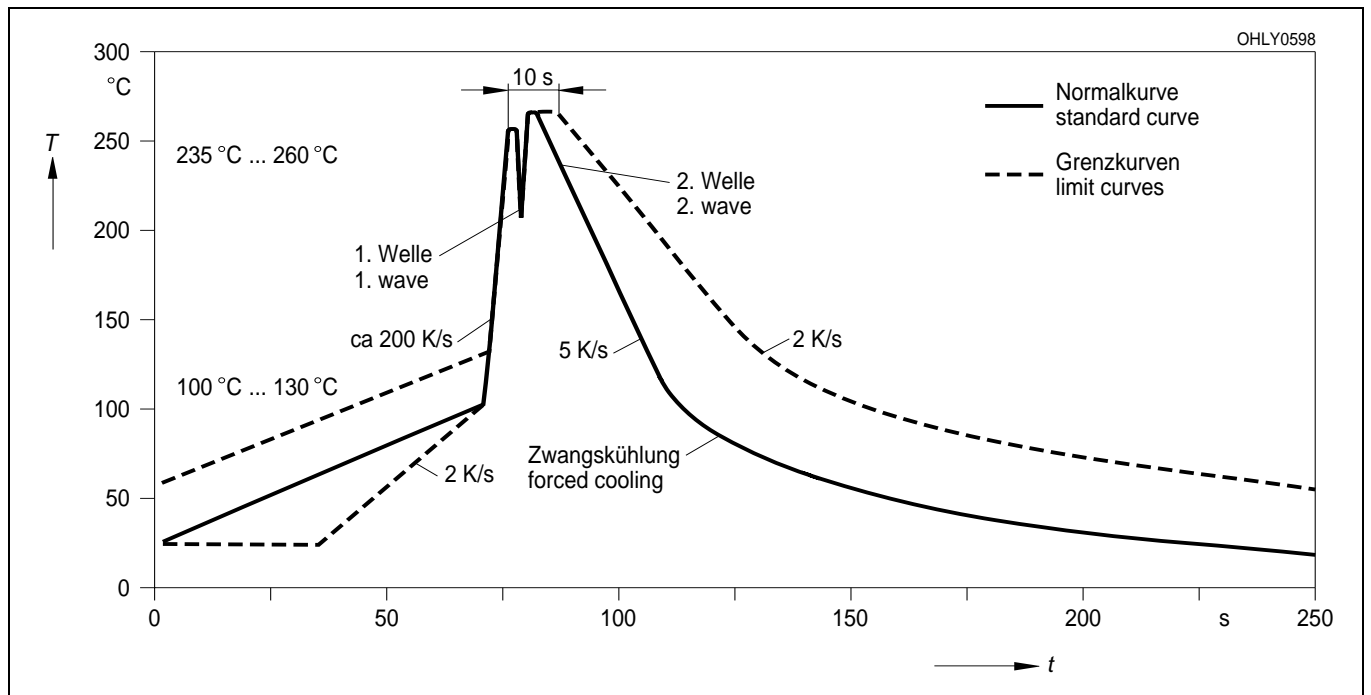
**Maßzeichnung
Package Outlines**



Maße in mm (inch) / Dimensions in mm (inch).

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

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



2007-04-02

5

Published by
OSRAM Opto Semiconductors GmbH
Wernerwerkstrasse 2, D-93049 Regensburg
www.osram-os.com
© All Rights Reserved.

EU RoHS and China RoHS compliant product



此产品符合欧盟 RoHS 指令的要求；

按照中国的相关法规和标准，不含有毒有害物质或元素。

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 ¹, may only be used in life-support devices or systems ² with the express written approval of OSRAM OS.

¹ 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.

² 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.