

# Silizium-PIN-Fotodiode mit sehr kurzer Schaltzeit in SMR® Gehäuse Silicon PIN Photodiode with Very Short Switching Time in SMR® Package Lead (Pb) Free Product - RoHS Compliant

## SFH 2500/FA SFH 2505/FA



SFH 2500



SFH 2500FA



SFH 2505



SFH 2505FA

### Wesentliche Merkmale

- Speziell geeignet für Anwendungen im Bereich von 400 nm bis 1100 nm (SFH 2500/2505) und bei 880 nm (SFH 2500 FA/2505 FA)
- SMR® (Surface Mount Radial) Gehäuse
- Kurze Schaltzeit (typ. 5 ns)
- Passend zu IRED SFH 451x, SFH 458x, SFH 450x
- Für Oberflächenmontage (SMT) geeignet
- Gegurtet lieferbar

### Anwendungen

- Industrieelektronik
- „Messen/Steuern/Regeln“
- Schnelle Lichtschranken für Gleich- und Wechselbetrieb
- Datenübertragung

### Features

- Especially suitable for applications from 400 nm to 1100 nm (SFH 2500/2505) and of 880 nm (SFH 2500 FA/2505 FA)
- SMR® (Surface Mount Radial) package
- Short switching time (typ. 5 ns)
- Matches IRED SFH 451x, SFH 458x, SFH 450x
- Suitable for surface mounting (SMT)
- Available on tape and reel

### Applications

- Industrial electronics
- For control and drive circuits
- Photointerrupters
- Data transmission

Typ Type	Bestellnummer Ordering Code	Gehäuse Package
SFH 2500	Q65110A1201	5-mm-SMR <sup>®</sup> -Gehäuse (T 1 3/4), klares (SFH 2500/2505) und schwarz eingefärbtes (SFH 2500 FA/2505 FA) Epoxy-Gießharz, Anschlüsse (SFH 2500/2500 FA gebogen, SFH 2505/2505 FA gerade) im 2.54-mm-Raster (1/10"), Kathodenkennzeichnung: siehe Maßzeichnung. 5 mm SMR <sup>®</sup> package (T 1 3/4), clear (SFH 2500/2505) and black-colored (SFH 2500 FA/2505 FA) epoxy resin, solder tabs (SFH 2500/2500 FA bent, SFH 2505/2505 FA straight) lead spacing 2.54 mm (1/10"), cathode marking: see package outline.
SFH 2505	Q65110A1203	
SFH 2500 FA	Q65110A1202	
SFH 2505 FA	Q65110A1204	

**Grenzwerte**  
**Maximum Ratings**

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Betriebs- und Lagertemperatur Operating and storage temperature range	$T_{op}; T_{stg}$	- 40 ... + 85	°C
Sperrspannung Reverse voltage	$V_R$	50	V
Verlustleistung Total power dissipation	$P_{tot}$	100	mW

Kennwerte ( $T_A = 25\text{ °C}$ )

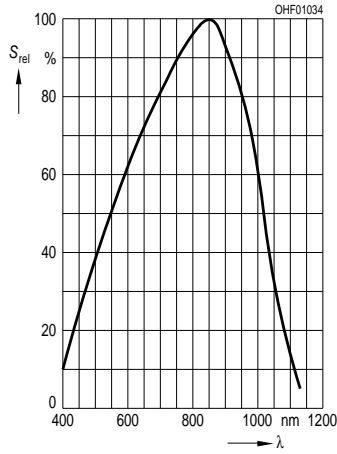
## Characteristics

Bezeichnung Parameter	Symbol Symbol	Wert Value		Einheit Unit
		SFH 2500 SFH 2505	SFH 2500 FA SFH 2505 FA	
Fotostrom Photocurrent $V_R = 5\text{ V}$ , Normlicht/standard light A, $T = 2856\text{ K}$ , $E_V = 1000\text{ lx}$ $V_R = 5\text{ V}$ , $\lambda = 870\text{ nm}$ , $E_e = 1\text{ mW/cm}^2$	$I_P$	100	–	$\mu\text{A}$
	$I_P$	70 (> 50)	70 (> 50)	$\mu\text{A}$
Wellenlänge der max. Fotoempfindlichkeit Wavelength of max. sensitivity	$\lambda_{S\text{ max}}$	850	900	nm
Spektraler Bereich der Fotoempfindlichkeit $S = 10\%$ von $S_{\text{max}}$ Spectral range of sensitivity $S = 10\%$ of $S_{\text{max}}$	$\lambda$	400 ... 1100	750 ... 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×mm
Halbwinkel Half angle	$\varphi$	$\pm 15$	$\pm 15$	Grad deg.
Dunkelstrom, $V_R = 20\text{ V}$ Dark current	$I_R$	$0.1 (\leq 5)$	$0.1 (\leq 5)$	nA
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	–	mV
	$V_O$	390 (> 320)	390 (> 320)	mV
Kurzschlussstrom Short-circuit current $E_V = 1000\text{ lx}$ , Normlicht/standard light A, $T = 2856\text{ K}$ $E_e = 1.0\text{ mW/cm}^2$ , $\lambda = 870\text{ nm}$	$I_{SC}$	100	–	$\mu\text{A}$
	$I_{SC}$	70	70	$\mu\text{A}$
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
Kapazität, $V_R = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$ Capacitance	$C_0$	11	11	pF

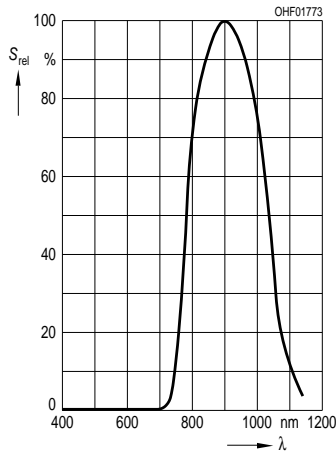
**Kennwerte** ( $T_A = 25\text{ °C}$ )  
**Characteristics** (cont'd)

Bezeichnung Parameter	Symbol Symbol	Wert Value		Einheit Unit
		SFH 2500 SFH 2505	SFH 2500 FA SFH 2505 FA	
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 0.1	- 0.1	%/K
Rauschäquivalente Strahlungsleistung Noise equivalent power $V_R = 20\text{ V}$ , $\lambda = 850\text{ nm}$	$NEP$	$2.9 \times 10^{-14}$	$2.9 \times 10^{-14}$	$\frac{W}{\sqrt{Hz}}$
Nachweisgrenze, $V_R = 20\text{ V}$ , $\lambda = 850\text{ nm}$ Detection limit	$D^*$	$3.5 \times 10^{12}$	$3.5 \times 10^{12}$	$\frac{cm \times \sqrt{Hz}}{W}$

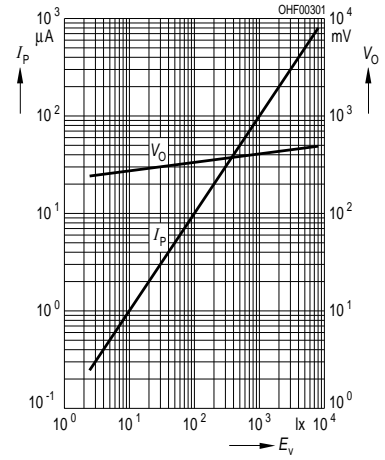
**Relative Spectral Sensitivity**  
 $S_{rel} = f(\lambda)$   
**SFH 2500/2505**



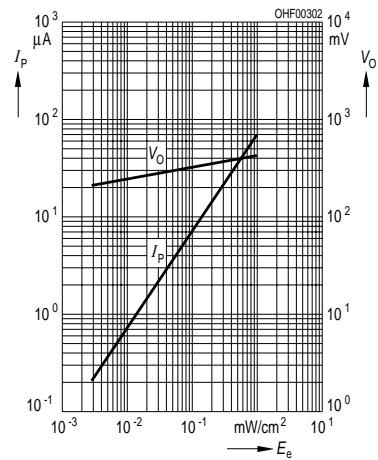
**Relative Spectral Sensitivity**  
 $S_{rel} = f(\lambda)$   
**SFH 2500 FA/2505 FA**



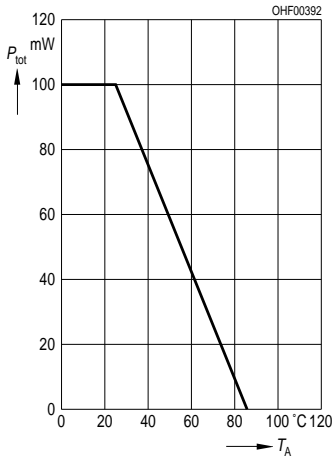
**Photocurrent  $I_P = f(E_v)$ ,  $V_R = 5 V$**   
**Open-Circuit Voltage  $V_O = f(E_v)$**   
**SFH 2500/2505**



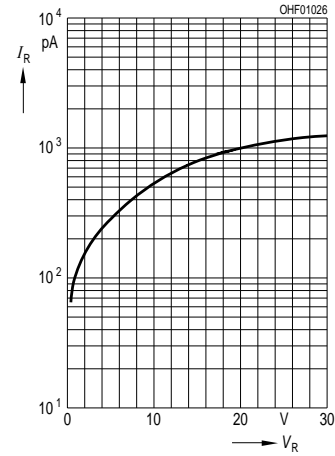
**Photocurrent  $I_P = f(E_e)$ ,  $V_R = 5 V$**   
**Open-Circuit Voltage  $V_O = f(E_e)$**   
**SFH 2500 FA/2505 FA**



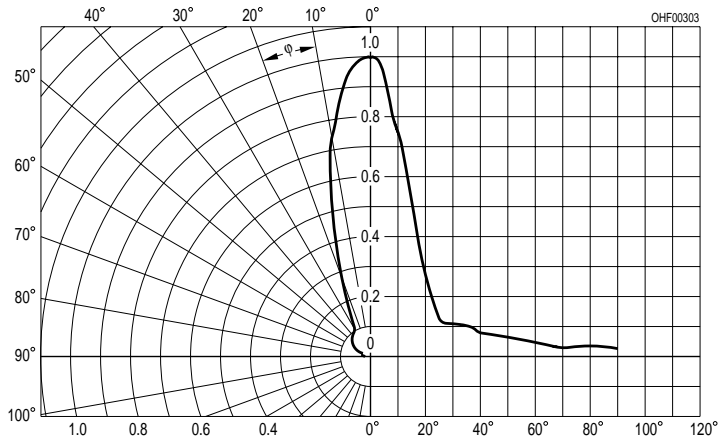
**Total Power Dissipation**  
 $P_{tot} = f(T_A)$



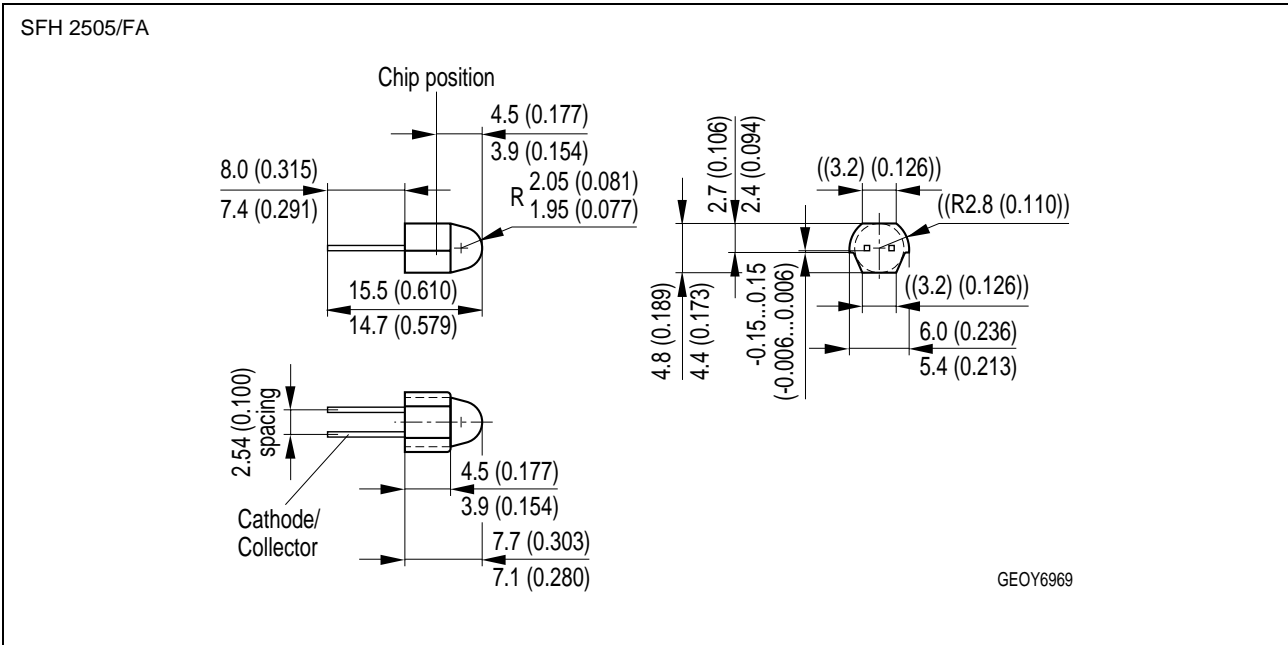
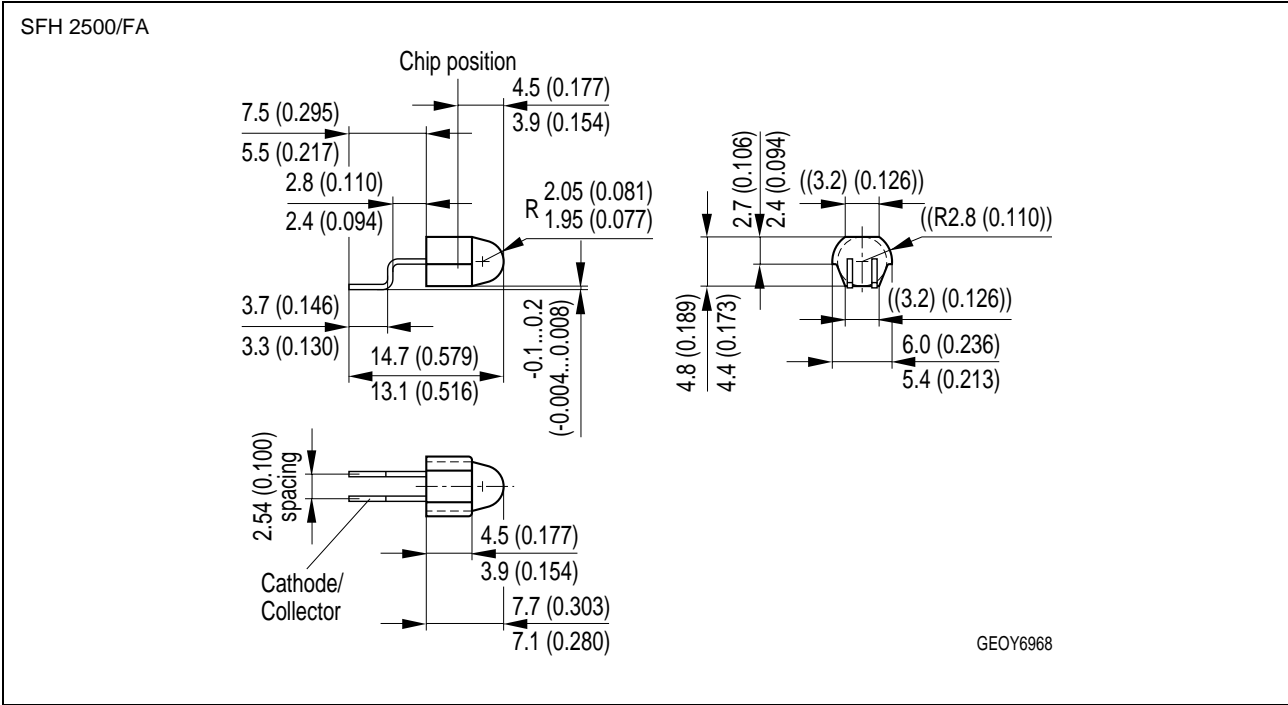
**Dark Current**  
 $I_R = f(V_R), E = 0$



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



Maßzeichnung  
Package Outlines



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

**Lötbedingungen**

**Soldering Conditions**

**Reflow Lötprofil für bleifreies Löten**

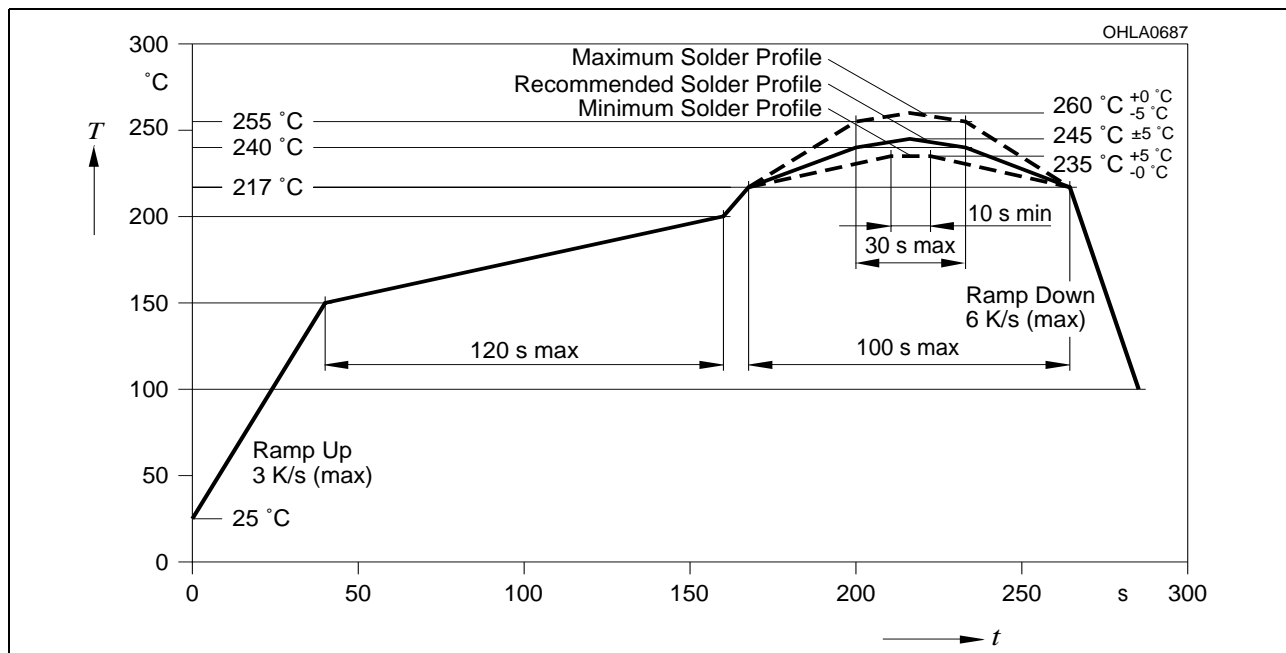
**Reflow Soldering Profile for lead free soldering**

Vorbehandlung nach JEDEC Level 3

Preconditioning acc. to JEDEC Level 3

(nach J-STD-020C)

(acc. to J-STD-020C)



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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.

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EU RoHS and China RoHS compliant product



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