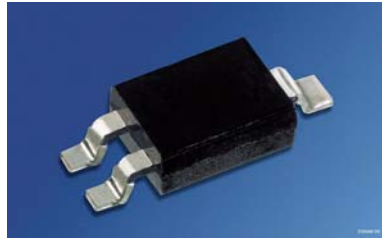


Silizium-PIN-Fotodiode mit sehr kurzer Schaltzeit Silicon PIN Photodiode with Very Short Switching Time

SFH 2400, SFH 2400FA, SFH 2400FAR



SFH 2400



SFH 2400FA



SFH 2400FAR

Wesentliche Merkmale

- Speziell geeignet für Anwendungen im Bereich von 380 nm bis 1100 nm (SFH 2400) und von 750 nm bis 1100 nm (SFH 2400FA und SFH 2400FAR)
- Kurze Schaltzeit (typ. 5 ns)

Anwendungen

- Industrieelektronik
- Automobilbereich (z.B. Regensensor)
- Schnelle Lichtschranken

Features

- Especially suitable for applications from 380 nm to 1100 nm (SFH 2400) and from 750 nm to 1100 nm (SFH 2400FA and SFH 2400FAR)
- Short switching time (typ. 5 ns)

Applications

- Industrial electronics
- Automotive (e.g. rainsensor)
- Photointerrupters

Typ Type	Bestellnummer Ordering Code	Fotostrom, $V_R = 5\text{ V}$, standard light A, $E_V = 1000\text{ lx}$ (SFH 2400) $E_e = 1\text{ mW/cm}^2$, $V_R = 5\text{ V}$, $\lambda = 870\text{ nm}$ (SFH 2400FA, SFH 2400FAR) Photocurrent I_p (μA)
SFH 2400	Q65110A2628	10 (> 6)
SFH 2400FA	Q65110A2638	6.2 (> 3.6)
SFH 2400FAR	Q65110A9563	6.2 (> 3.6)

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	20	V
Sperrspannung $t < 2$ min Reverse voltage $t < 2$ min	V_R	50	V
Verlustleistung Total power dissipation	P_{tot}	120	mW
Wärmewiderstand für Montage auf PC-Board Thermal resistance for mounting on pcb	R_{thJA}	450	K/W

Kennwerte ($T_A = 25$ °C)
Characteristics

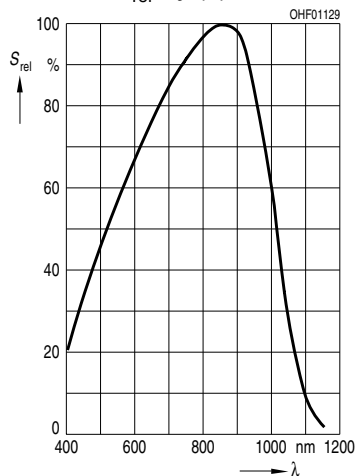
Bezeichnung Parameter	Symbol Symbol	Wert Value		Einheit Unit
		SFH 2400	SFH 2400FA SFH 2400FAR	
Fotostrom Photocurrent $V_R = 5$ V, Normlicht/standard light A, $T = 2856$ K, $E_V = 1000$ lx $V_R = 5$ V, $\lambda = 870$ nm, $E_e = 1$ mW/cm ²	I_P I_P	10 (> 6) 6.5	– 6.2 (> 3.6)	µA µA
Wellenlänge der max. 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	380 ... 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	± 60	± 60	Grad deg.

Kennwerte ($T_A = 25\text{ °C}$)

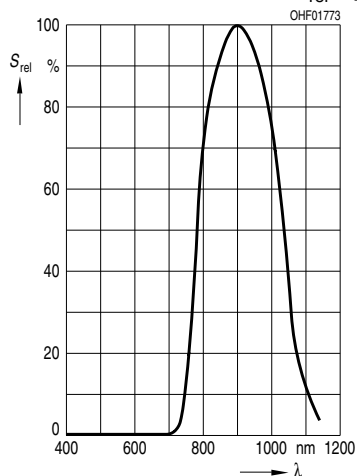
Characteristics (cont'd)

Bezeichnung Parameter	Symbol Symbol	Wert Value		Einheit Unit
		SFH 2400	SFH 2400FA SFH 2400FAR	
Dunkelstrom, $V_R = 20\text{ V}$ Dark current	I_R	1 (< 5)	1 (< 5)	nA
Leerlaufspannung Open-circuit voltage $E_v = 1000\text{ lx}$, Normlicht/standard light A, $T = 2856\text{ K}$ $E_e = 1\text{ mW/cm}^2$, $\lambda = 870\text{ nm}$	V_O V_O	320 –	– 320	mV mV
Kurzschlußstrom Short-circuit current $E_v = 1000\text{ lx}$, Normlicht/standard light A, $T = 2856\text{ K}$ $E_e = 1\text{ mW/cm}^2$, $\lambda = 870\text{ nm}$	I_{SC} I_{SC}	10 –	– 6.0	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 $\lambda = 870\text{ nm}$	TC_I	0.18 –	– 0.1	%/K
Rauschäquivalente Strahlungsleistung Noise equivalent power $V_R = 20\text{ V}$, $\lambda = 870\text{ nm}$	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}	$\frac{\text{cm} \times \sqrt{\text{Hz}}}{\text{W}}$

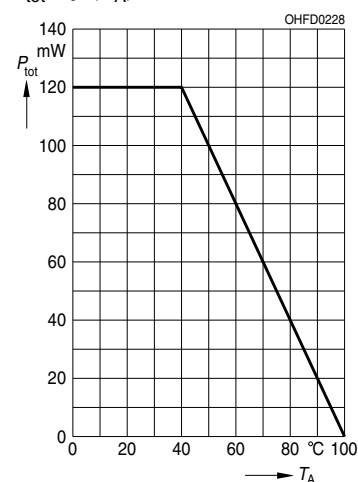
Relative Spectral Sensitivity
SFH 2400, $S_{rel} = f(\lambda)$



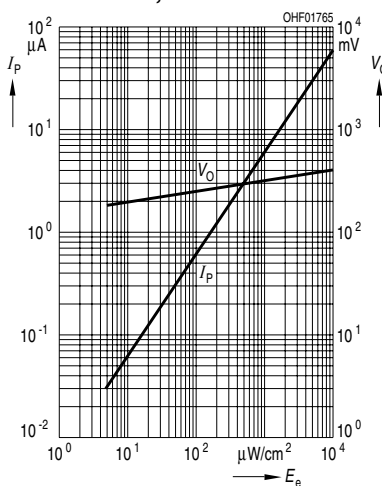
Relative Spectr. Sensitivity
SFH 2400FA, SFH 2400FAR $S_{rel} = f(\lambda)$



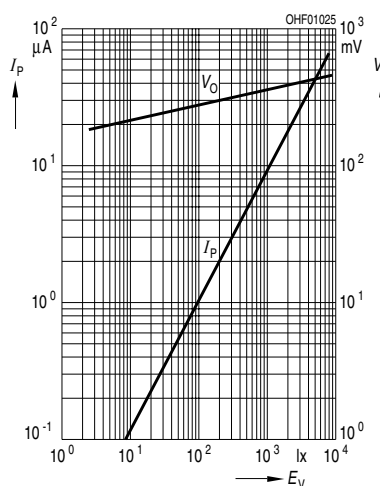
Total Power Dissipation
 $P_{tot} = f(T_A)$



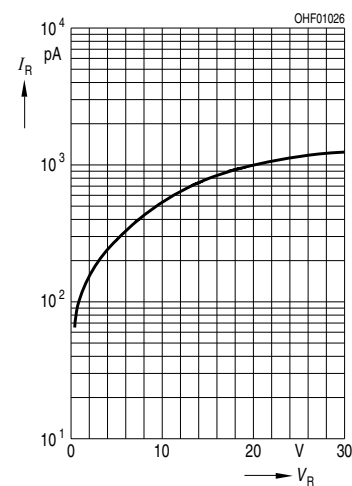
Photocurrent $I_P = f(E_e)$, $V_R = 5\text{ V}$
Open-Circuit Voltage $V_O = f(E_e)$
SFH 2400FA, SFH 2400FAR



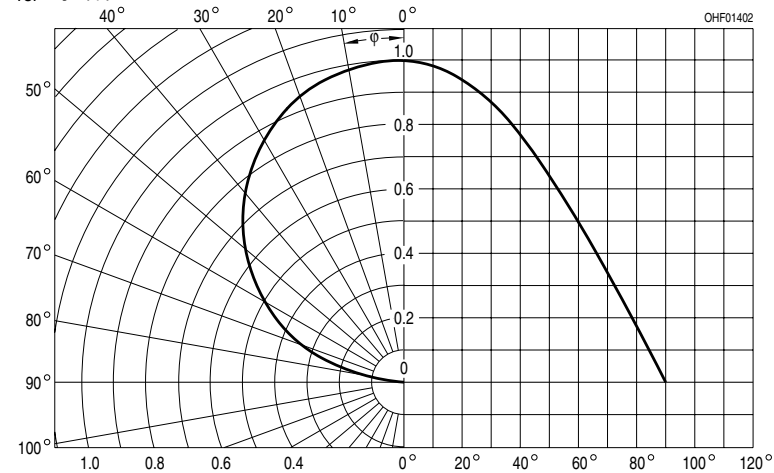
Photocurrent $I_P = f(E_v)$, $V_R = 5\text{ V}$
Open-Circuit Voltage $V_O = f(E_v)$
SFH 2400



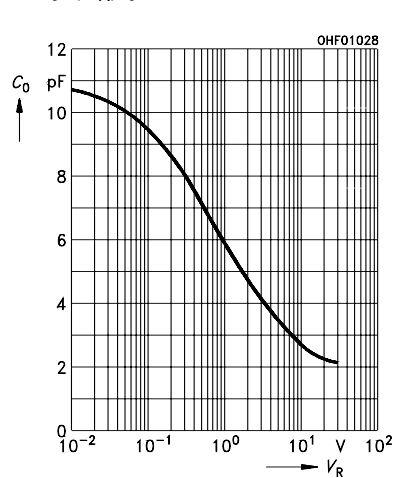
Dark Current
 $I_R = f(V_R), E = 0$



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

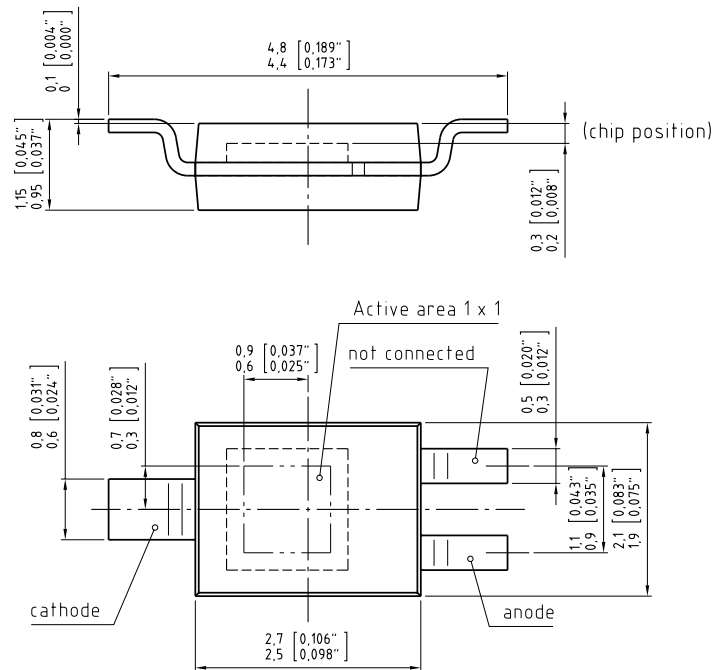


Capacitance
 $C = f(V_R), f = 1\text{ MHz}, E = 0$



**Maßzeichnung
Package Outlines**

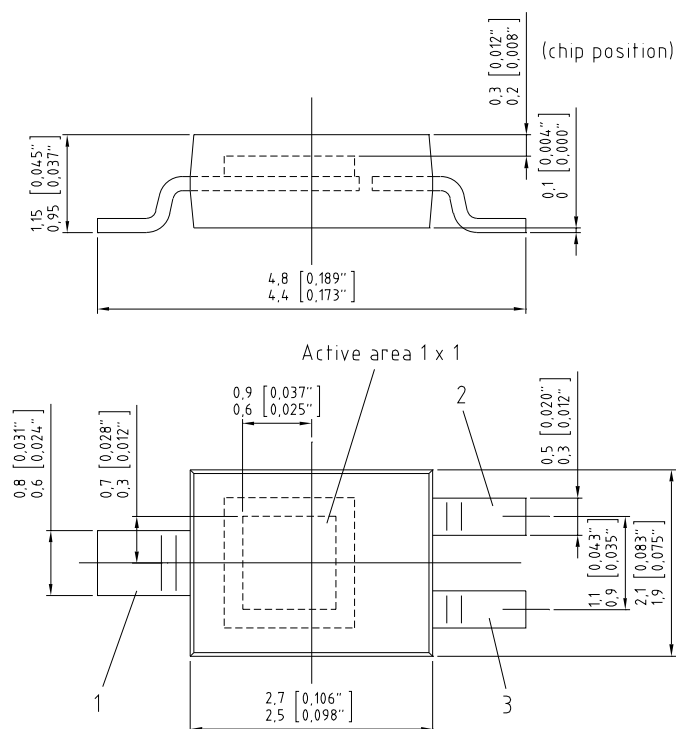
SFH 2400FAR



C63062-A4001-A2... -03

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

SFH 2400
SFH 2400FA

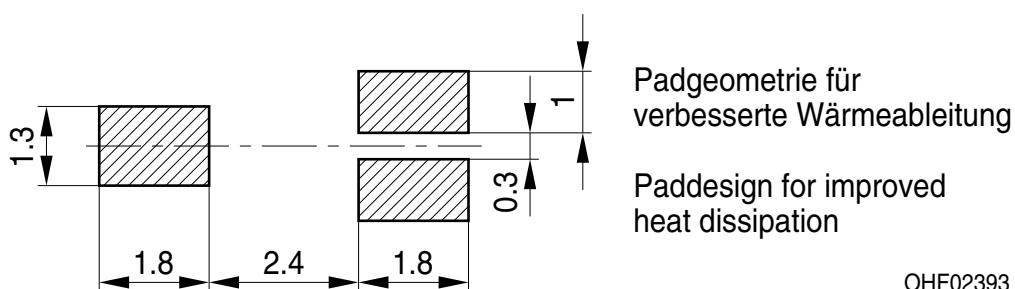


C63062-A4001-A1 -03

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

Anschlussbelegung	Pin 1 = Kathode / cathode
Pin configuration	Pin 2 = n.c.
	Pin 3 = Anode / Anode

Empfohlenes Lötpaddesign Recommended Solderpad Design



OHF02393

Maße in mm / Dimensions in mm.

Lötbedingungen

Soldering Conditions

Reflow Lötprofil für bleifreies Löt

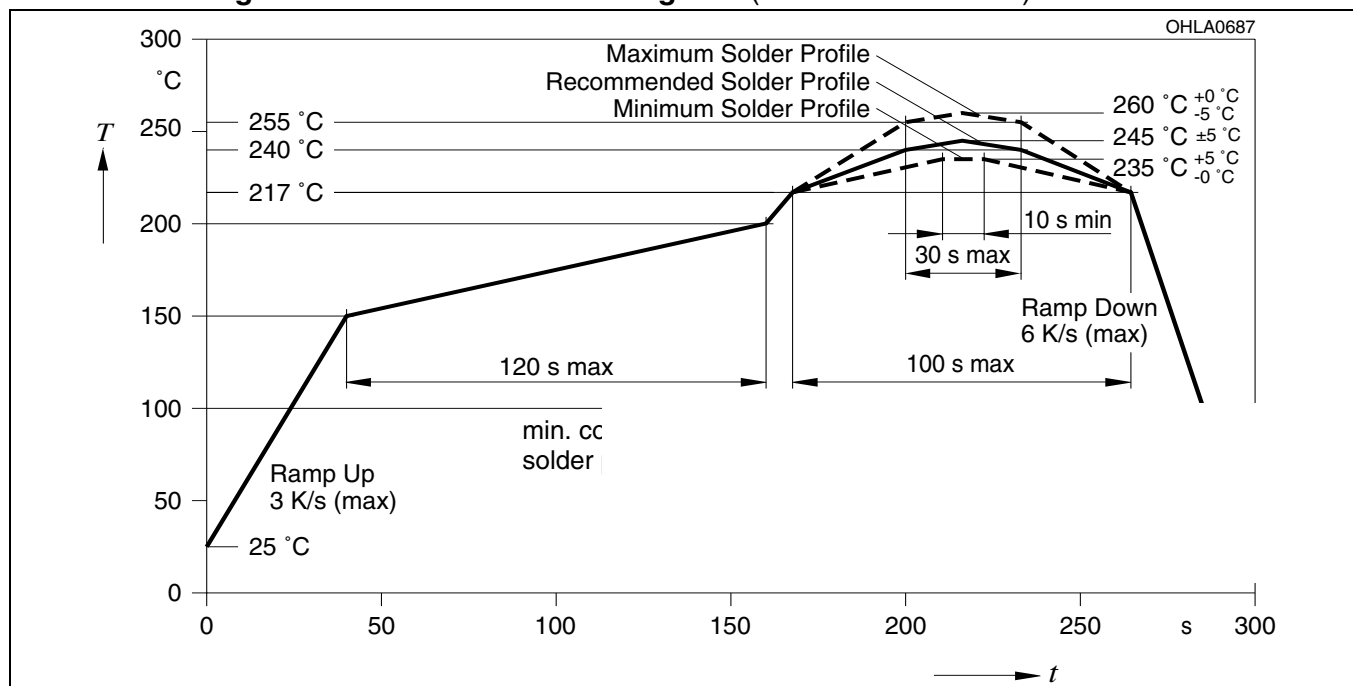
Reflow Soldering Profile for lead free soldering

Vorbehandlung nach JEDEC Level 4

Preconditioning acc. to JEDEC Level 4

(nach J-STD-020C)

(acc. to J-STD-020C)



Published by
OSRAM Opto Semiconductors GmbH
Leibnizstrasse 4, D-93055 Regensburg
www.osram-os.com

© All Rights Reserved.

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 components¹, may only be used in life-support devices or systems² 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.

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。