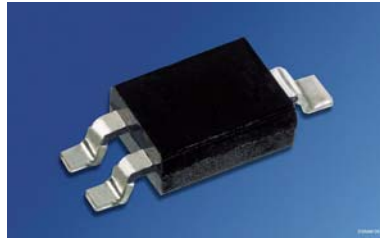


Silizium-PIN-Fotodiode mit sehr kurzer Schaltzeit Silicon PIN Photodiode with Very Short Switching Time

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

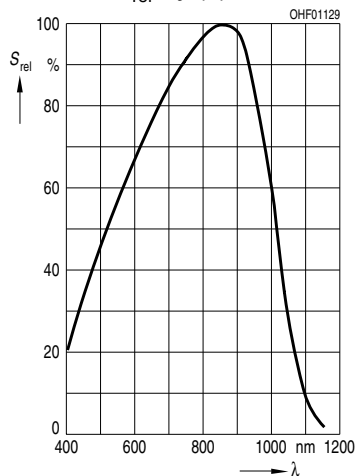
Bezeichnung Parameter	Symbol Symbol	Wert Value		Einheit Unit
		SFH 2400	SFH 2400FA SFH 2400FAR	
Fotostrom Photocurrent $V_R = 5$ V, Normlicht/standard light A, $T = 2856$ K, $E_V = 1000$ lx $V_R = 5$ V, $\lambda = 870$ nm, $E_e = 1$ mW/cm ²	I_P I_P	10 (> 6) 6.5	– 6.2 (> 3.6)	µA µA
Wellenlänge der max. 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 ($T_A = 25\text{ °C}$)

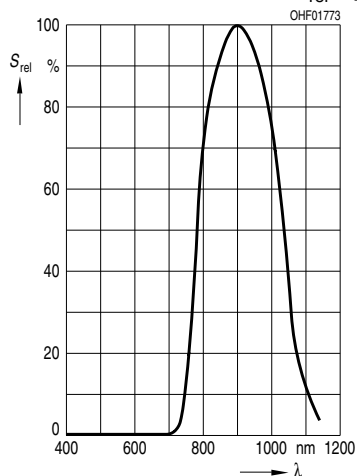
Characteristics (cont'd)

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}	$\frac{\text{cm} \times \sqrt{\text{Hz}}}{\text{W}}$

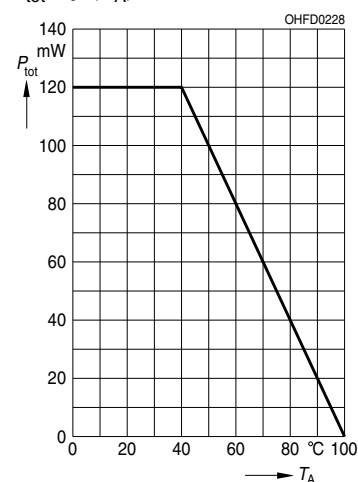
Relative Spectral Sensitivity
SFH 2400, $S_{rel} = f(\lambda)$



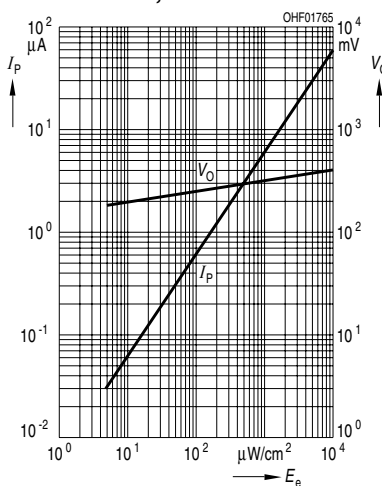
Relative Spectr. Sensitivity
SFH 2400FA, SFH 2400FAR $S_{rel} = f(\lambda)$



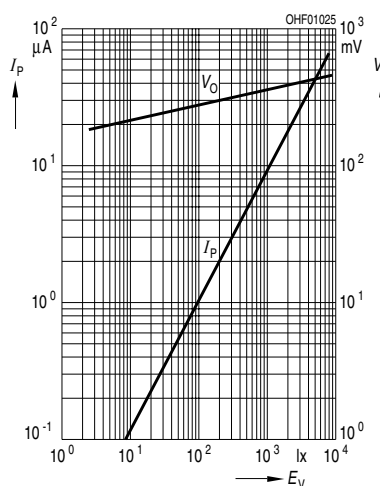
Total Power Dissipation
 $P_{tot} = f(T_A)$



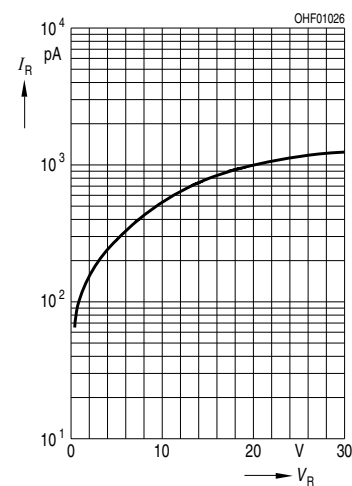
Photocurrent $I_P = f(E_e)$, $V_R = 5\text{ V}$
Open-Circuit Voltage $V_O = f(E_e)$
SFH 2400FA, SFH 2400FAR



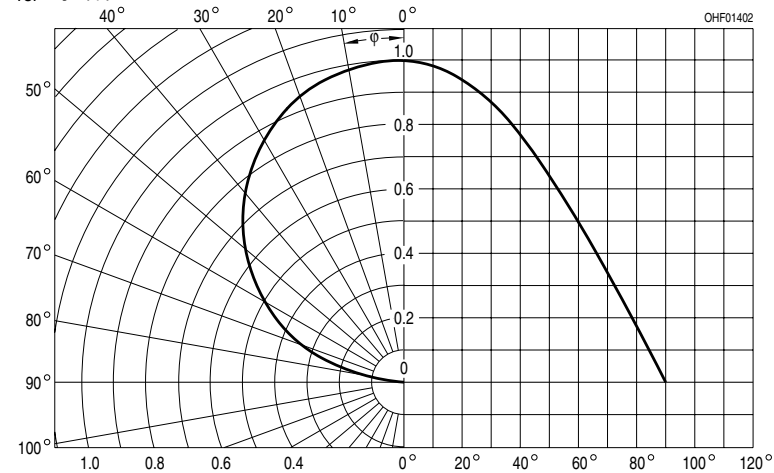
Photocurrent $I_P = f(E_v)$, $V_R = 5\text{ V}$
Open-Circuit Voltage $V_O = f(E_v)$
SFH 2400



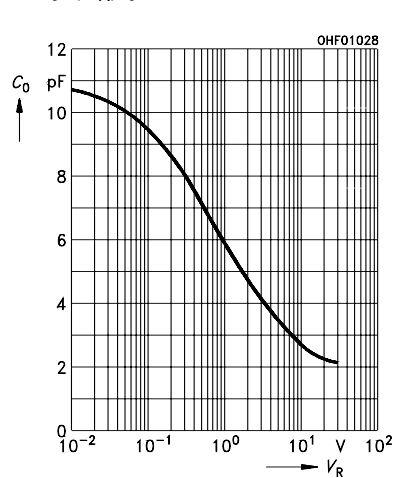
Dark Current
 $I_R = f(V_R), E = 0$



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

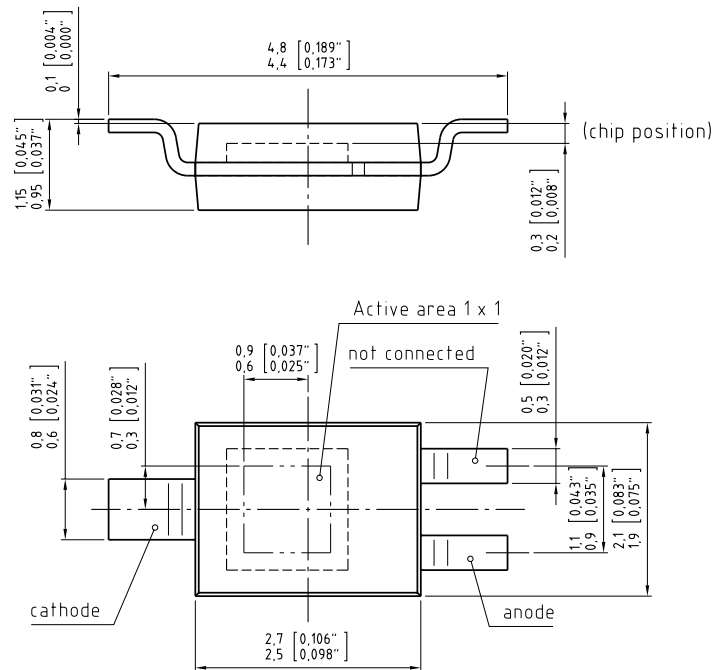


Capacitance
 $C = f(V_R), f = 1\text{ MHz}, E = 0$



**Maßzeichnung
Package Outlines**

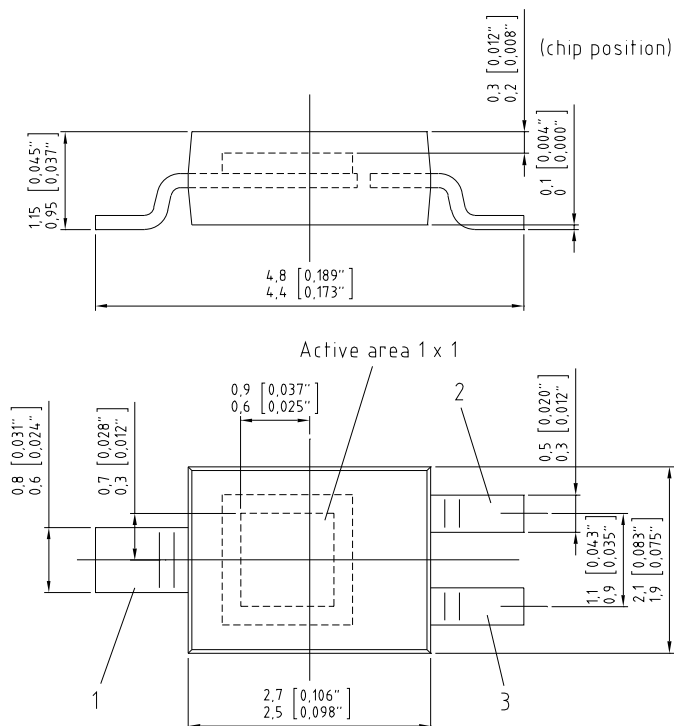
SFH 2400FAR



C63062-A4001-A2... -03

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

SFH 2400
SFH 2400FA

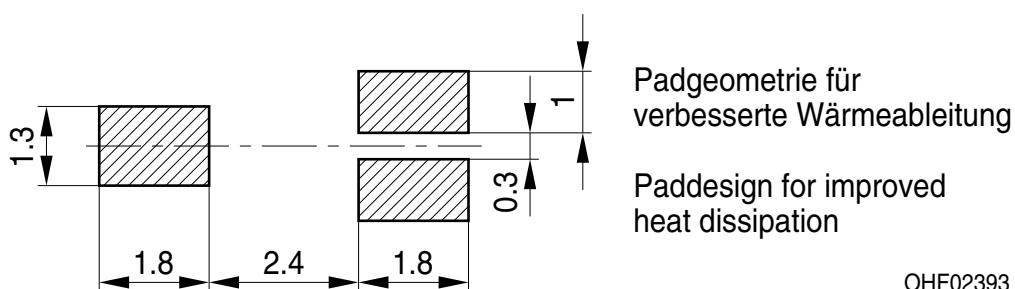


C63062-A4001-A1 -03

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

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

Empfohlenes Lötpad Design Recommended Solderpad Design



OHF02393

Maße in mm / Dimensions in mm.

Lötbedingungen

Soldering Conditions

Reflow Lötprofil für bleifreies Löt

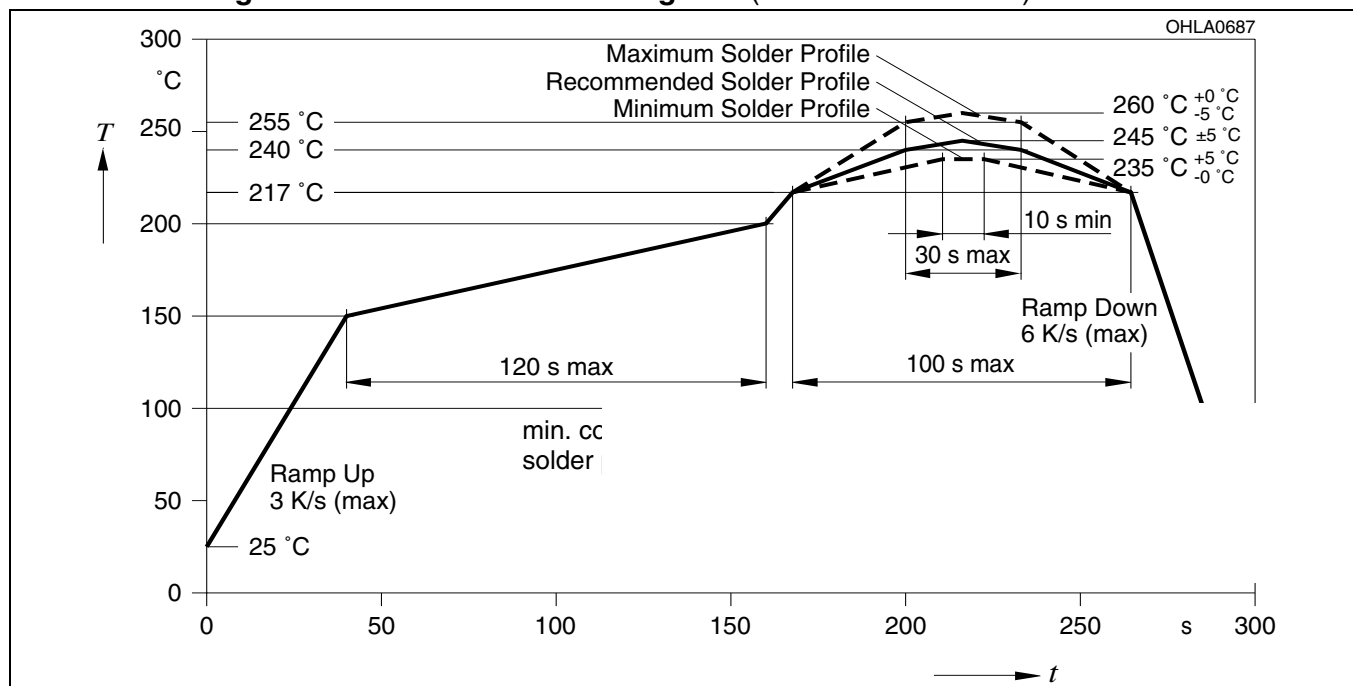
Reflow Soldering Profile for lead free soldering

Vorbehandlung nach JEDEC Level 4

Preconditioning acc. to JEDEC Level 4

(nach J-STD-020C)

(acc. to J-STD-020C)



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