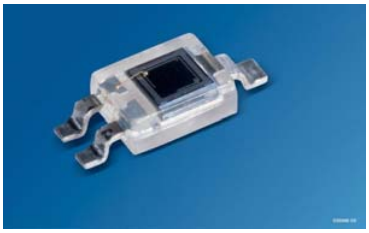
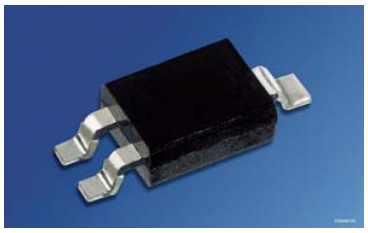
Silizium-PIN-Fotodiode mit sehr kurzer Schaltzeit
Silicon PIN Photodiode with Very Short Switching Time

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)

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)

Anwendungen

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

Applications

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

Typ **Type**	**Bestellnummer** **Ordering Code**	**Fotostrom**, V_R = 5 V, standard light A, E_V = 1000 lx (SFH 2400) E_e=1 mW/cm^2, V_R = 5 V, λ = 870 nm (SFH 2400FA, SFH 2400FAR) **Photocurrent** Ip (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

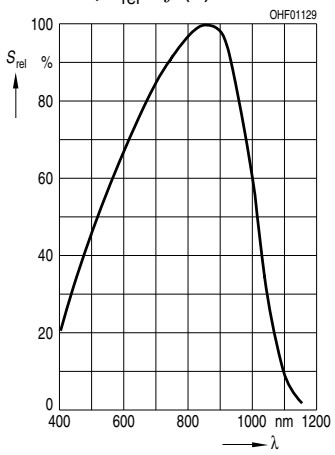
Kennwerte (T_A = 25 °C)
Characteristics

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	I_P	10 (> 6)	–	µA
V_R = 5 V, λ = 870 nm, E_e = 1 mW/cm²	I_P	6.5	6.2 (> 3.6)	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	mm²
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.

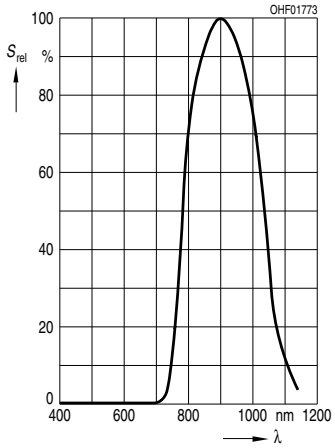
Kennwerte (T_A = 25 °C)
Characteristics (cont'd)

Bezeichnung **Parameter**	**Symbol** **Symbol**	**Wert** **Value**		**Einheit** **Unit**
		SFH 2400	**SFH 2400FA** **SFH 2400FAR**	
Dunkelstrom, V_R = 20 V Dark current	I_R	1 (< 5)	1 (< 5)	nA
Leerlaufspannung Open-circuit voltage E_v = 1000 lx, Normlicht/standard light A, T = 2856 K E_e = 1 mW/cm², λ = 870 nm	 V_O V_O	 320 –	 – 320	 mV mV
Kurzschlußstrom Short-circuit current E_v = 1000 lx, Normlicht/standard light A, T = 2856 K E_e = 1 mW/cm², λ = 870 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 Ω; V_R = 20 V; λ = 850 nm; I_p = 800 µA	t_r, t_f	5	5	ns
Durchlaßspannung, I_F = 80 mA, E = 0 Forward voltage	V_F	1.3	1.3	V
Kapazität, V_R = 0 V, f = 1 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 λ = 870 nm	TC_I	 0.18 –	 – 0.1	%/K
Rauschäquivalente Strahlungsleistung Noise equivalent power V_R = 20 V, λ = 870 nm	NEP	2.9×10^{-14}	2.9×10^{-14}	$\frac{W}{\sqrt{Hz}}$
Nachweisgrenze, V_R = 20 V, λ = 870 nm Detection limit	D*	3.5×10^{12}	3.5×10^{12}	$\frac{cm \times \sqrt{Hz}}{W}$

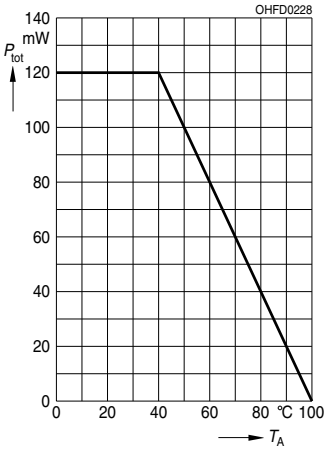
Relative Spectral Sensitivity
SFH 2400, $S_{rel} = f(\lambda)$



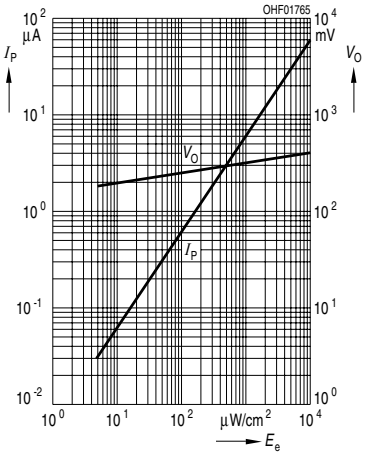
Relative Spectr. Sensitivity
SFH 2400FA,SFH 2400FAR $S_{rel} = f(\lambda)$



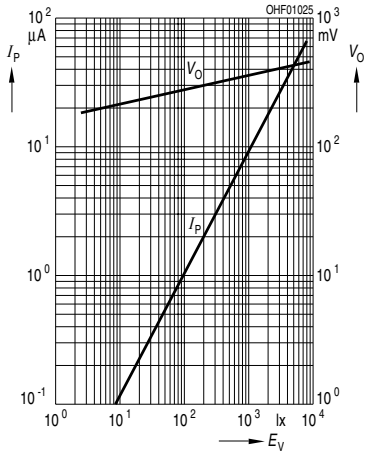
Total Power Dissipation
$P_{tot} = f(T_A)$



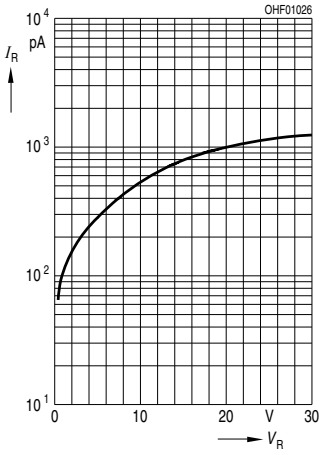
Photocurrent $I_P = f(E_e)$, V_R = 5 V
Open-Circuit Voltage $V_O = f(E_e)$
SFH 2400FA, SFH 2400FAR



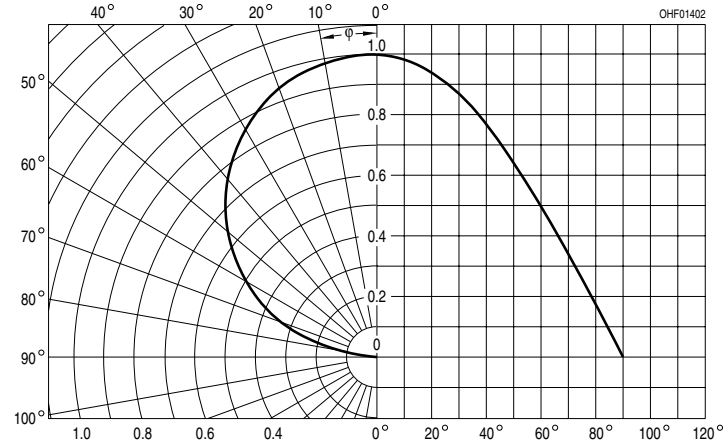
Photocurrent $I_P = f(E_v)$, V_R = 5 V
Open-Circuit Voltage $V_O = f(E_v)$
SFH 2400



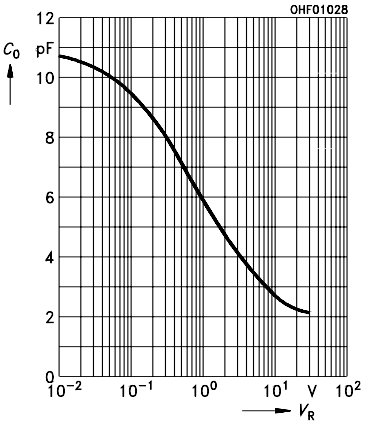
Dark Current
$I_R = f(V_R)$, E = 0



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

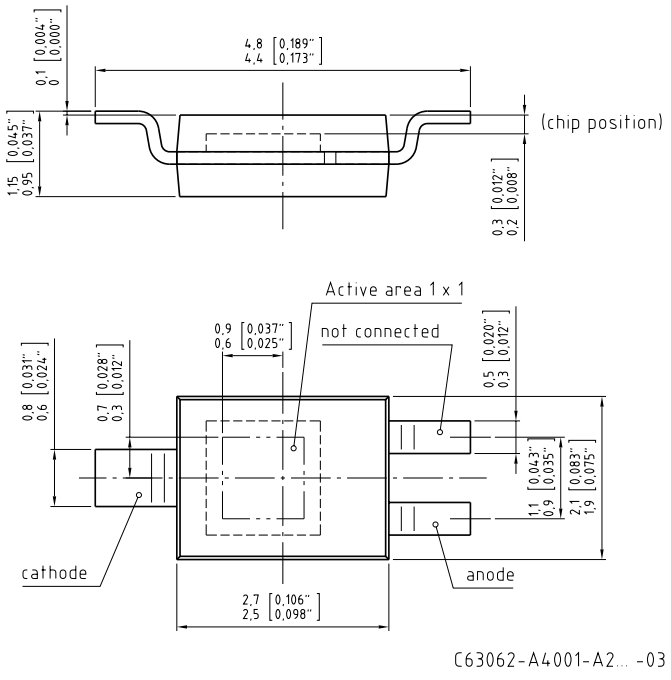


Capacitance
$C = f(V_R)$, f = 1 MHz, E = 0



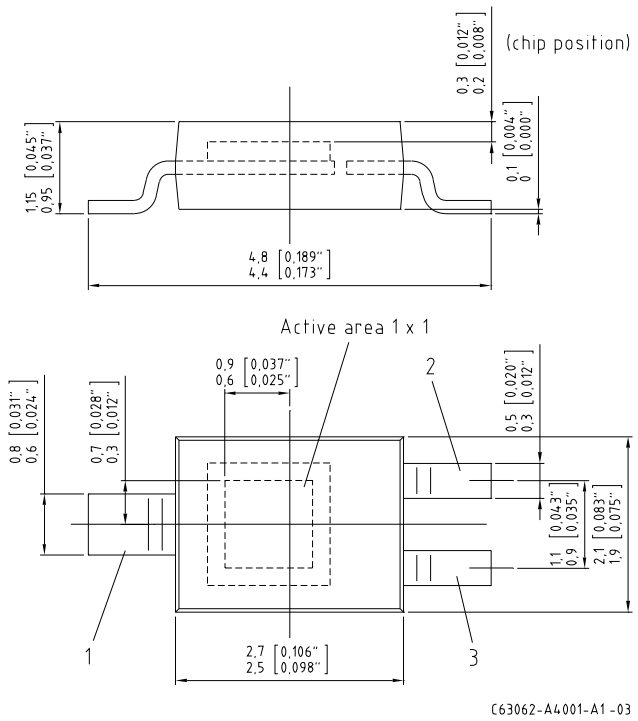
Maßzeichnung
Package Outlines

SFH 2400FAR



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

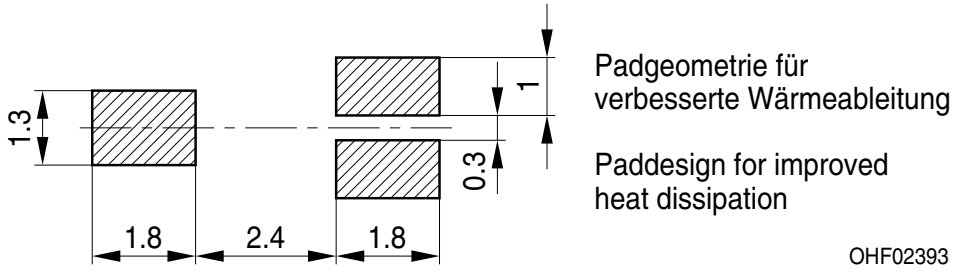
SFH 2400
SFH 2400FA



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

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

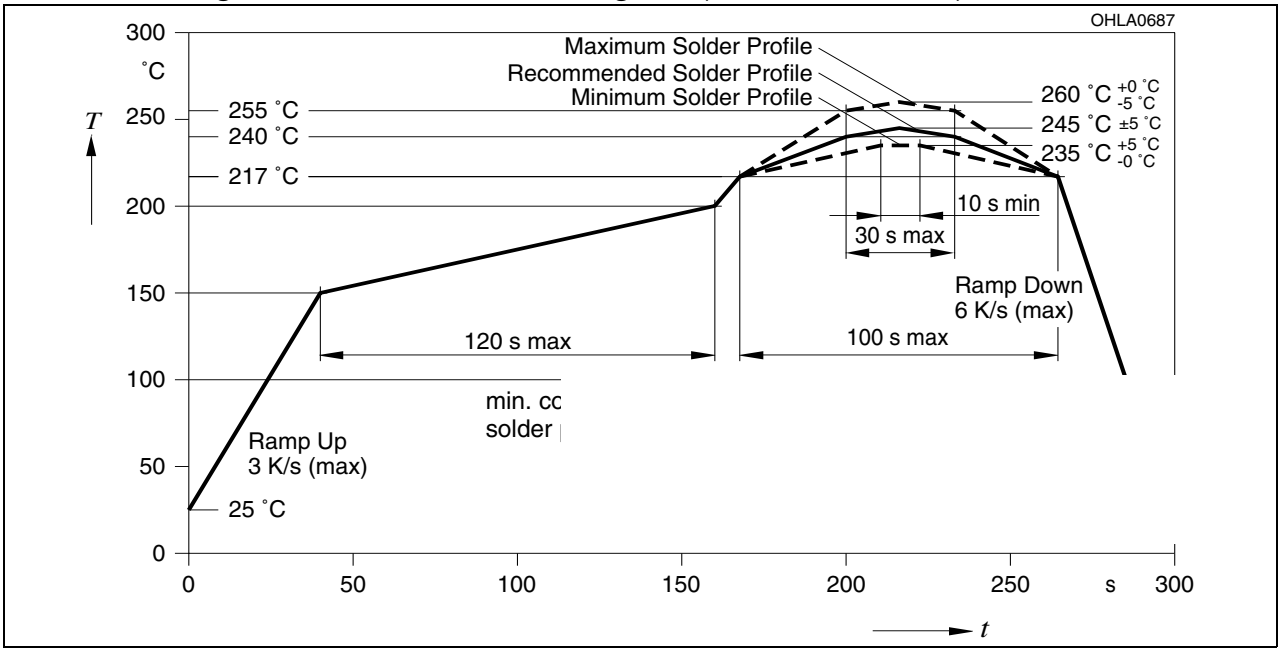
Empfohlenes Lötpaddesign
Recommended Solderpad Design



Maße in mm / Dimensions in mm.

Lötbedingungen
Soldering Conditions
Reflow Lötprofil für bleifreies Löten
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)



EU RoHS and China RoHS compliant product

此产品符合欧盟 RoHS 指令的要求；

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