

NPN-Silizium-Fototransistor in SMR® Gehäuse
Silicon NPN Phototransistor in SMR® Package
Lead (Pb) Free Product - RoHS Compliant

SFH 3500



Wesentliche Merkmale

- **Spektraler Bereich der Fotoempfindlichkeit:**
450 nm ...1060 nm
- **Gehäuse:** SMR® (Surface Mount Radial), Harz
- **Besonderheit des Bauteils:**
hohe Fotoempfindlichkeit
- **Gehäusegleich:** IRED SFH 4500, SFH 4515

Anwendungen

- Fertigungs- und Kontrollanwendungen der Industrie
- „Messen/Steuern/Regeln“
- Lichtschranken

Features

- **Spectral Range of Sensitivity:**
450 nm ...1060 nm
- **Package:** SMR® (Surface Mount Radial), Epoxy
- **Feature of the device:**
high photosensitivity
- **Package Match:** IR emitter SFH 4500, SFH 4515

Applications

- A variety of manufacturing and monitoring applications
- For control and drive circuits
- Photointerrupters

Typ Type	Bestellnummer Ordering Code	Fotostrom , $E_e = 0.5 \text{ mW/cm}^2$, $\lambda = 950 \text{ nm}$, $V_{CE} = 5 \text{ V}$ Photocurrent $I_{PCE} \text{ (mA)}$
SFH 3500	Q65110A2636	4.0...20.0

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
Kollektor-Emitterspannung Collector-emitter voltage	V_{CE} $V_{CE} (t < 2 \text{ min})$	35 70	V V
Kollektorstrom Collector current	I_C	50	mA
Kollektorspitzenstrom, $\tau < 10 \mu\text{s}$ Collector surge current	I_{CS}	100	mA
Emitter-Kollektorspannung Emitter-collector voltage	V_{EC}	7	V
Verlustleistung, $T_A = 25 \text{ °C}$ Total power dissipation	P_{tot}	150	mW
Wärmewiderstand Thermal resistance	R_{thJA}	400	K/W

Kennwerte ($T_A = 25\text{ °C}$, $\lambda = 950\text{ nm}$)

Characteristics

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Wellenlänge der max. Fotoempfindlichkeit Wavelength of max. sensitivity	$\lambda_{S\text{ max}}$	830	nm
Spektraler Bereich der Fotoempfindlichkeit $S = 10\%$ von S_{max} Spectral range of sensitivity $S = 10\%$ of S_{max}	λ	450 ... 1060	nm
Bestrahlungsempfindliche Fläche Radiant sensitive area	A	0.55	mm ²
Abmessungen der Chip-Fläche Dimension of chip area	$L \times B$ $L \times W$	1.00 × 1.00	mm × mm
Halbwinkel Half angle	φ	± 13	Grad deg.
Kapazität, $V_{CE} = 5\text{ V}$, $f = 1\text{ MHz}$, $E = 0$ Capacitance	C_{CE}	10	pF
Dunkelstrom, $V_{CE} = 20$ Dark current	I_{CEO}	3 (< 200)	nA

Die Fototransistoren werden nach ihrer Fotoempfindlichkeit gruppiert und mit arabischen Ziffern gekennzeichnet.

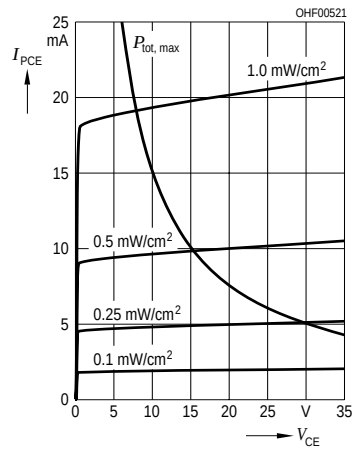
The phototransistors are grouped according to their spectral sensitivity and distinguished by arabian figures.

Bezeichnung Parameter	Symbol Symbol	Wert Value			Einheit Unit
		-4	-5	-6	
Fotostrom Photocurrent $E_e = 0.5 \text{ mW/cm}^2$, $\lambda = 950 \text{ nm}$, $V_{CE} = 5 \text{ V}$	I_{PCE}	4.0 ... 8.0	6.3 ... 12.5	10.0 ... 20.0	mA
Anstiegszeit/Abfallzeit Rise and fall time $R_L = 1 \text{ k}\Omega$, $V_{CC} = 5 \text{ V}$, $\lambda = 950 \text{ nm}$, $I_C = 1 \text{ mA}$	t_r , t_f	17	20	24	μs
Kollektor-Emitter-Sättigungsspannung Collector-emitter saturation voltage $I_C = I_{PCEmin}^{1)} \times 0.3$, $E_e = 0.5 \text{ mW/cm}^2$	V_{CEsat}	150 (< 200)	150 (< 200)	150 (< 200)	mV

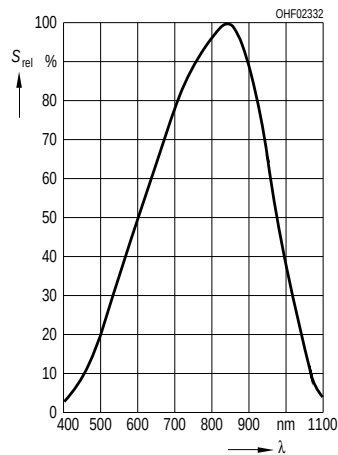
¹⁾ I_{PCEmin} ist der minimale Fotostrom der jeweiligen Gruppe.

¹⁾ I_{PCEmin} is the min. photocurrent of the specified group.

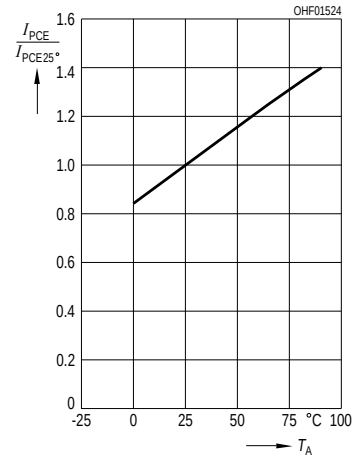
Photocurrent $I_{PCE} = f(V_{CE})$,
 $E_e = \text{Parameter}$



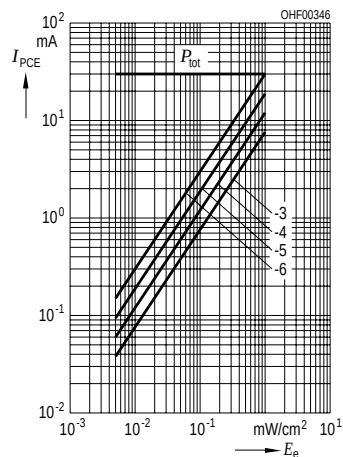
Relative Spectral Sensitivity,
 $S_{rel} = f(\lambda)$



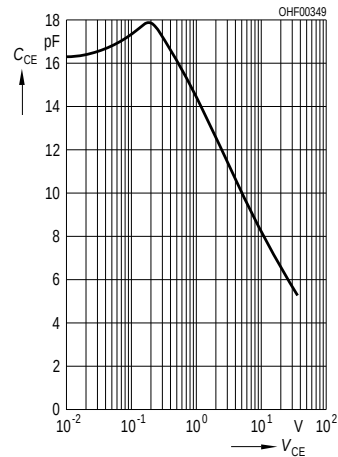
Photocurrent
 $I_{PCE} / I_{PCE25^\circ} = f(T_A)$, $V_{CE} = 5 \text{ V}$



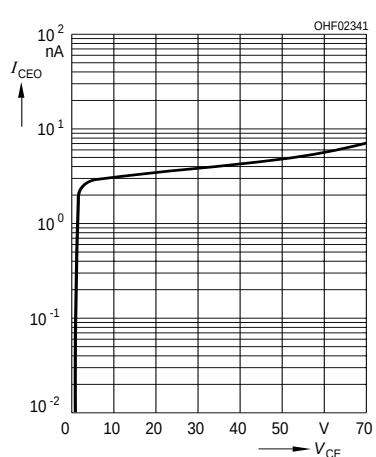
Photocurrent
 $I_{PCE} = f(E_e)$, $V_{CE} = 5 \text{ V}$



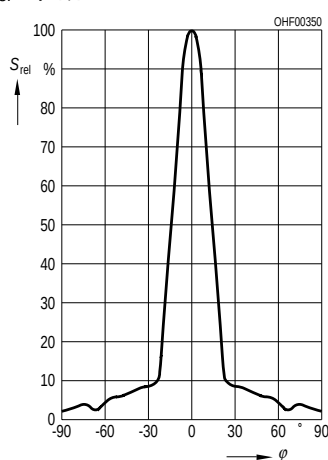
Capacitance
 $C_{CE} = f(V_{CE})$, $f = 1 \text{ MHz}$, $E = 0$



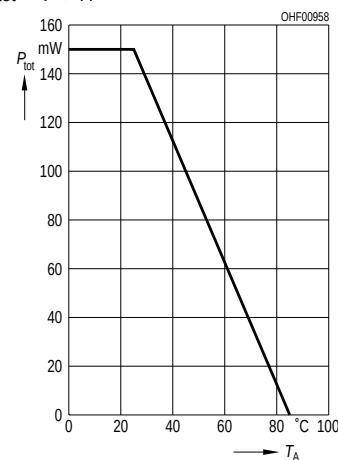
Dark Current
 $I_{CEO} = f(V_{CE})$, $E = 0$



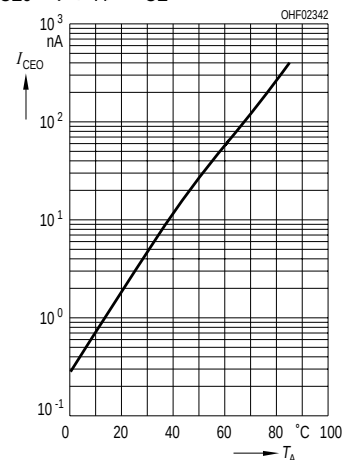
Directional Characteristics
 $S_{rel} = f(\varphi)$



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

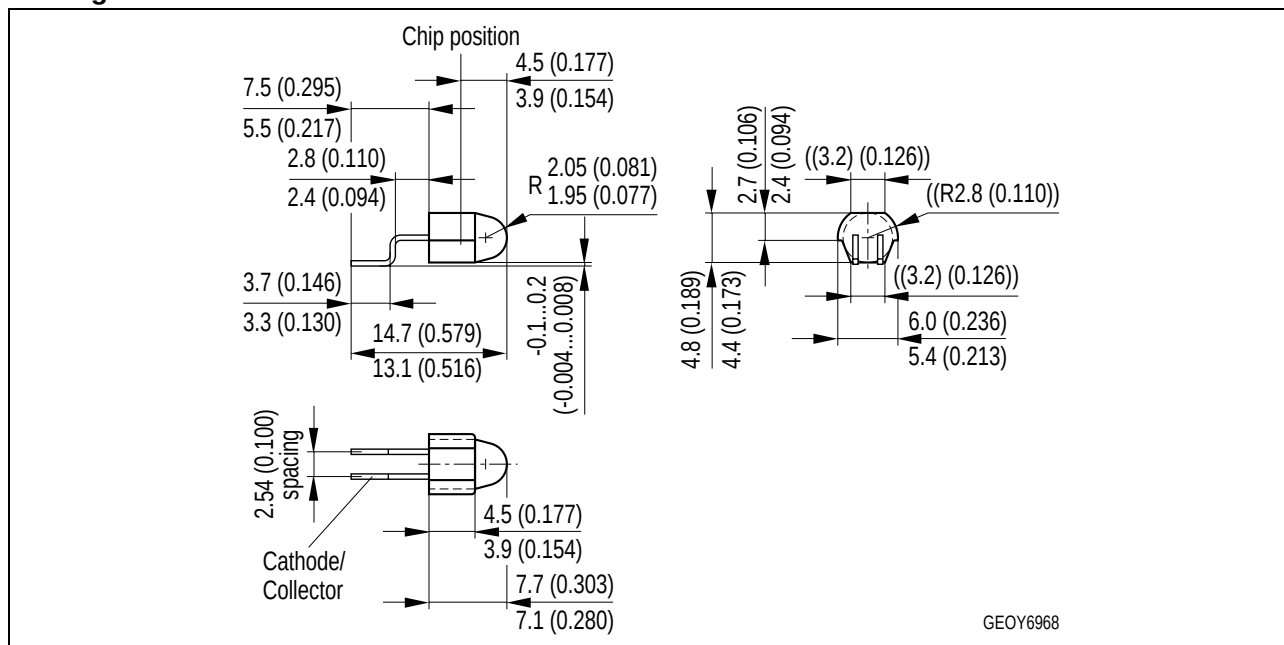


Dark Current
 $I_{CEO} = f(T_A)$, $V_{CE} = 20 \text{ V}$, $E = 0$

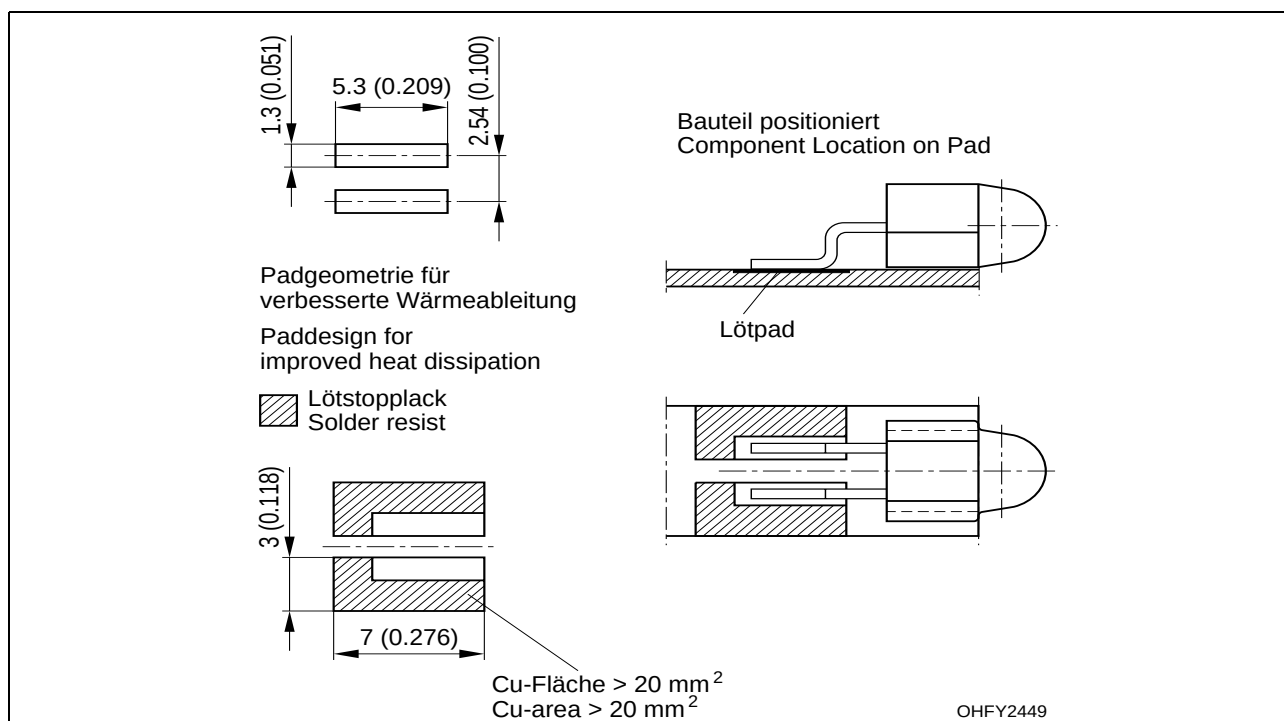


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Maßzeichnung Package Outlines



Empfohlenes Lötpaddesign Recommended Solderpad Design



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

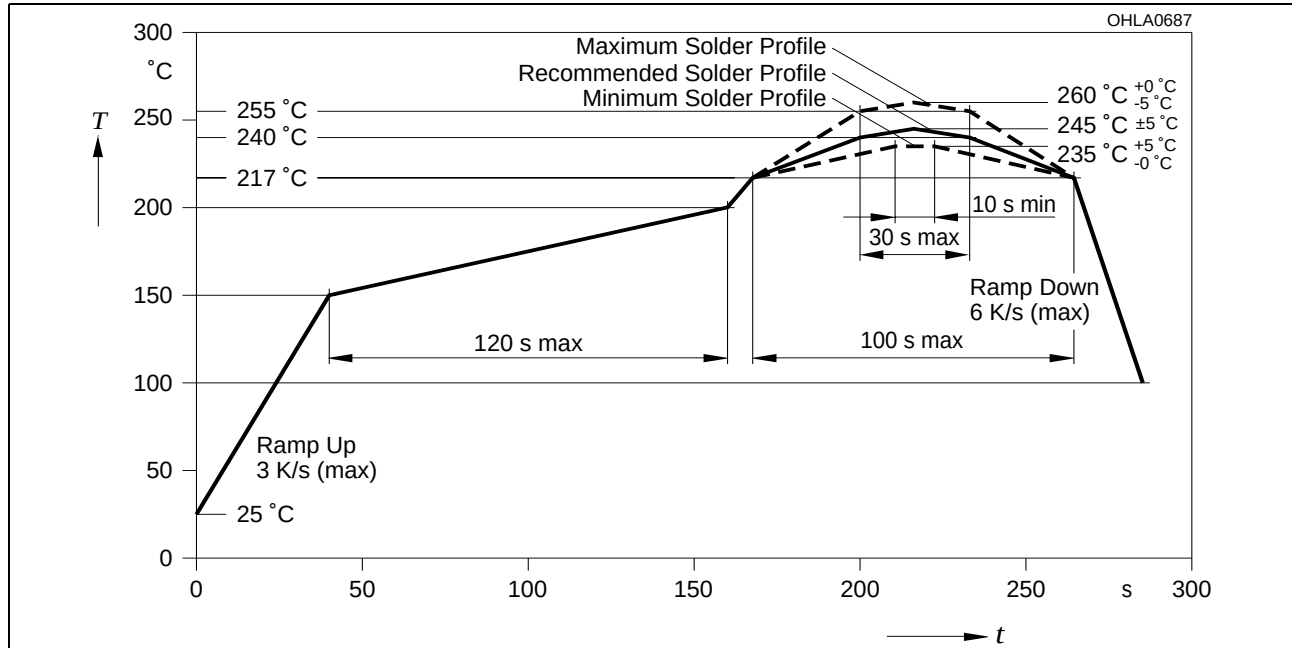
Lötbedingungen**Soldering Conditions****Reflow Lötprofil für bleifreies Löt****Reflow Soldering Profile for lead free soldering**

Vorbehandlung nach JEDEC Level 3

Preconditioning acc. to JEDEC Level 3

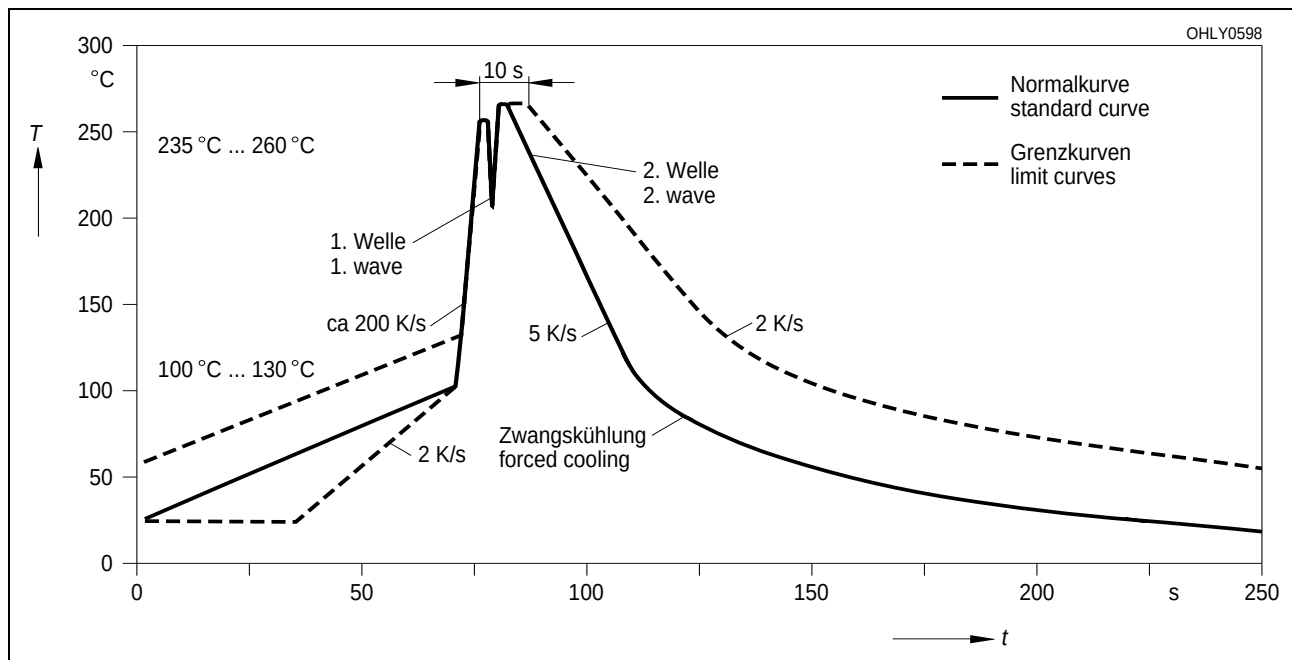
(nach J-STD-020C)

(acc. to J-STD-020C)

**Wellenlötten (TTW)****TTW Soldering**

(nach CECC 00802)

(acc. to CECC 00802)



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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.