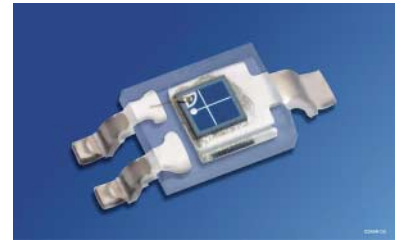


NPN-Silizium-Fototransistor
Silicon NPN Phototransistor
Lead (Pb) Free Product - RoHS Compliant

SFH 3401



Wesentliche Merkmale

- Speziell geeignet für Anwendungen im Bereich von 460 nm bis 1080 nm
- Hohe Linearität
- SMT-Bauform mit Basisanschluß, geeignet für Vapor Phase-Löten und IR-Reflow-Löten
- Nur gegurtet lieferbar

Anwendungen

- Umgebungslicht-Detektor
- Lichtschranken für Gleich- und Wechsellichtbetrieb
- Industrieelektronik
- „Messen/Steuern/Regeln“

Features

- Especially suitable for applications from 460 nm to 1080 nm
- High linearity
- SMT package with base connection, suitable for vapor phase and IR reflow soldering
- Available only on tape and reel

Applications

- Ambient light detector
- Photointerrupters
- Industrial electronics
- For control and drive circuits

Typ Type	Bestellnummer Ordering Code
SFH 3401	Q65110A2635
SFH 3401-2/3	Q65110A2644

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
Kollektor-Emitterspannung Collector-emitter voltage	V_{CE}	20	V
Kollektor-Emitterspannung, $t < 120$ s Collector-emitter voltage	V_{CE}	70	V
Kollektorstrom Collector current	I_C	50	mA
Kollektorspitzenstrom, $\tau < 10$ µs Collector surge current	I_{CS}	100	mA
Emitter-Kollektorspannung Emitter-collector voltage	V_{EC}	7	V
Verlustleistung, $T_A = 25$ °C 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 ($T_A = 25\text{ °C}$, $\lambda = 950\text{ nm}$)

Characteristics

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Wellenlänge der max. Fotoempfindlichkeit Wavelength of max. sensitivity	$\lambda_{S\text{ max}}$	850	nm
Spektraler Bereich der Fotoempfindlichkeit $S = 10\%$ von S_{max} Spectral range of sensitivity $S = 10\%$ of S_{max}	λ	460 ...1080	nm
Bestrahlungsempfindliche Fläche Radiant sensitive area	A	0.55	mm ²
Abmessungen der Chipfläche Dimensions of chip area	$L \times B$ $L \times W$	1×1	mm × mm
Halbwinkel Half angle	φ	± 60	Grad deg.
Kapazität, $V_{CE} = 0\text{ V}$, $f = 1\text{ MHz}$, $E = 0$ Capacitance	C_{CE}	15	pF
Kapazität, $V_{CB} = 0\text{ V}$, $f = 1\text{ MHz}$, $E = 0$ Capacitance	C_{CB}	45	pF
Kapazität, $V_{EB} = 0\text{ V}$, $f = 1\text{ MHz}$, $E = 0$ Capacitance	C_{EB}	19	pF
Dunkelstrom Dark current $V_{CE} = 10\text{ V}$, $E = 0$	I_{CEO}	3 (≤ 200)	nA
Fotostrom der Kollektor-Basis Fotodiode Photocurrent of collector-base photodiode $E_e = 0.1\text{ mW/cm}^2$, $V_{CB} = 5\text{ V}$ $E_v = 1000\text{ lx}$, Normlicht/standard light A, $V_{CB} = 5\text{ V}$	I_{PCB} I_{PCB}	0.28 4.8	μA μA

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

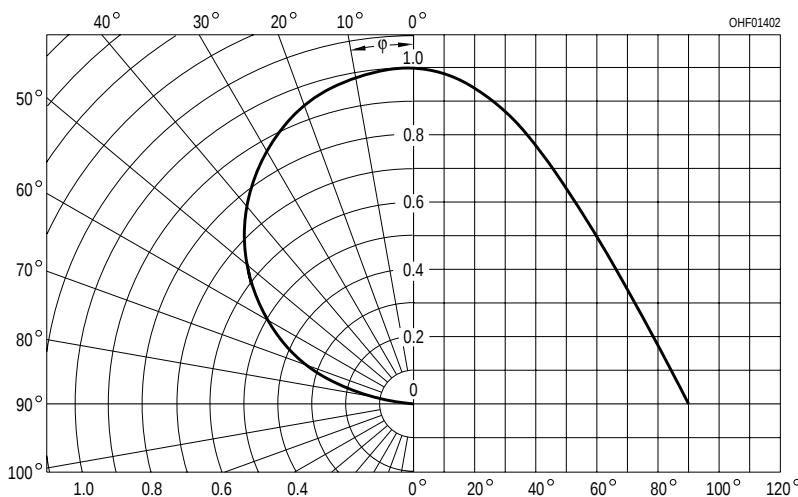
The phototransistors are grouped according to their spectral sensitivity and distinguished by arabian figures.

Bezeichnung Parameter	Symbol Symbol	Wert Value			Einheit Unit
		-1	-2	-3	
Fotostrom, $\lambda = 950 \text{ nm}$ Photocurrent $E_e = 0.1 \text{ mW/cm}^2$, $V_{CE} = 5 \text{ V}$ $E_v = 1000 \text{ lx}$, Normlicht A/ standard light A, $V_{CE} = 5 \text{ V}$	I_{PCE} I_{PCE}	63 ...125 1.65	100 ...200 2.6	160 ...320 4.2	μA mA
Anstiegszeit/Abfallzeit Rise and fall time $I_C = 1 \text{ mA}$, $V_{CC} = 5 \text{ V}$, $R_L = 1 \text{ k}\Omega$	t_r , t_f	16	24	34	μs
Kollektor-Emitter- Sättigungsspannung Collector-emitter saturation voltage $I_C = I_{PCEmin}^{1)} \times 0.3$, $E_e = 0.1 \text{ mW/cm}^2$	V_{CEsat}	170	170	170	mV
Stromverstärkung Current gain $E_e = 0.1 \text{ mW/cm}^2$, $V_{CE} = 5 \text{ V}$	I_{PCE}/I_{PCB}	340	530	860	—

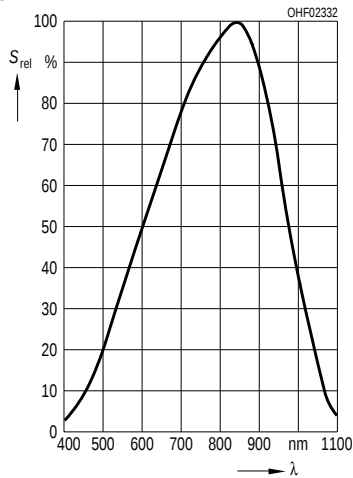
1) I_{PCEmin} ist der minimale Fotostrom der jeweiligen Gruppe.

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

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

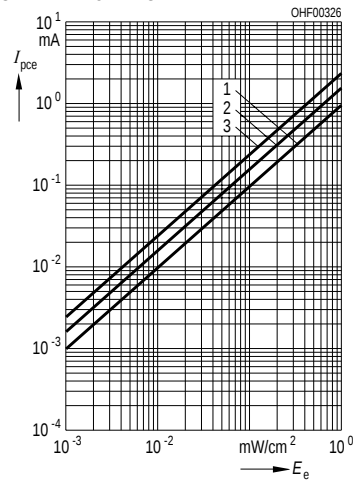


Rel. Spectral Sensitivity,
 $S_{\text{rel}} = f(\lambda)$



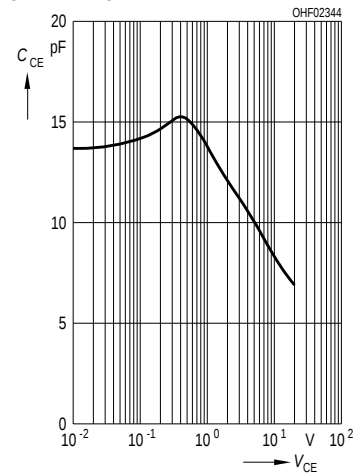
Photocurrent

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

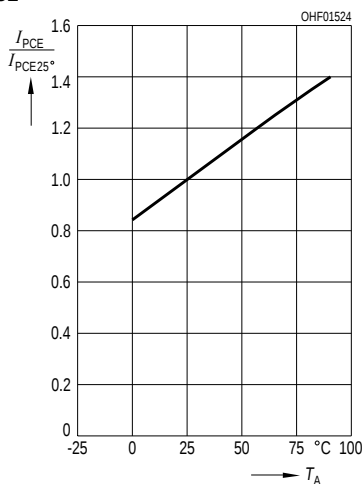


Collector-Emitter Capacitance

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

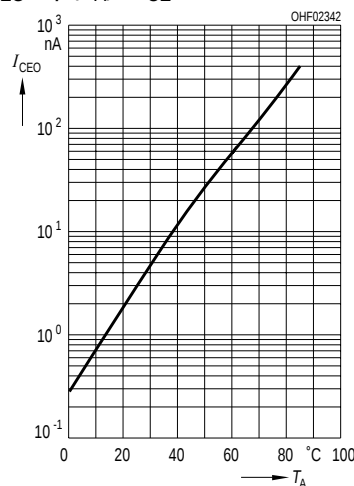


**Photocurrent $I_{\text{PCE}} = f(T_A)$,
 $V_{\text{CE}} = 5 \text{ V}$, normalized to 25 °C**



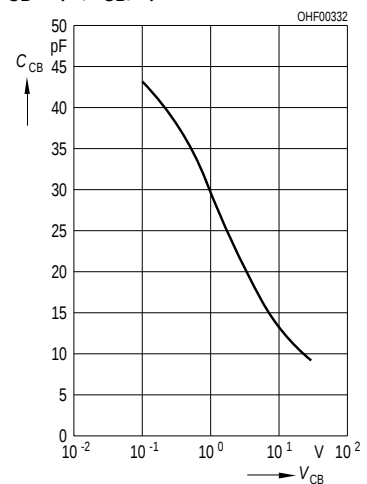
Dark Current

$$I_{\text{CEO}} = f(T_A), V_{\text{CE}} = 10 \text{ V}, E = 0$$

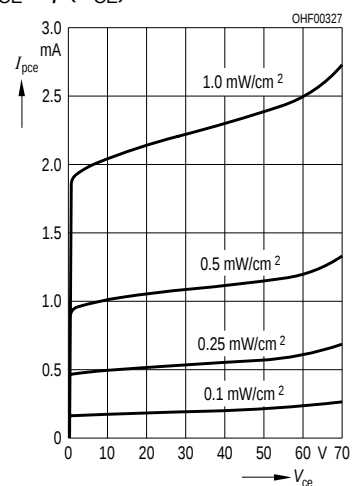


Collector-Base Capacitance

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

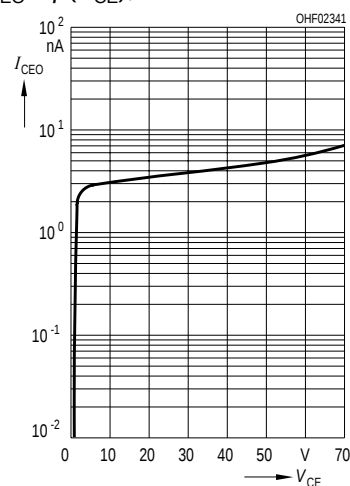


Photocurrent
 $I_{\text{PCE}} = f(V_{\text{CE}})$ SFH 3401-3



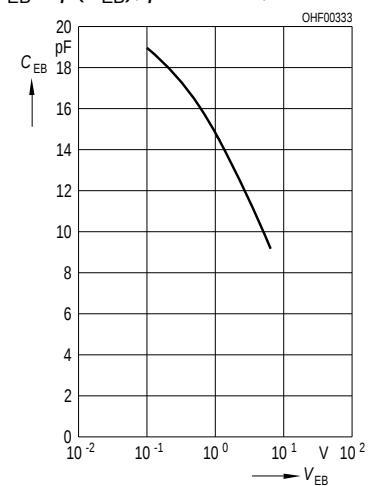
Dark Current

$$I_{\text{CEO}} = f(V_{\text{CE}}), E = 0$$



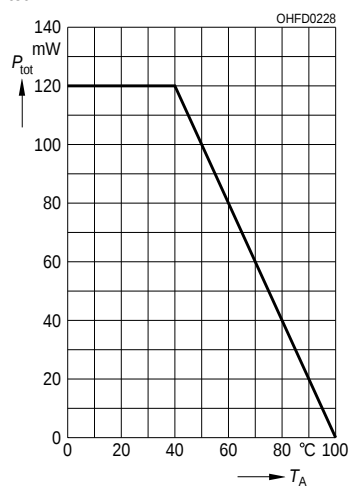
Emitter-Base Capacitance

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

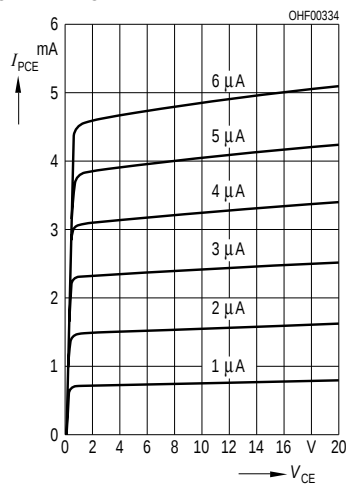


Total Power Dissipation

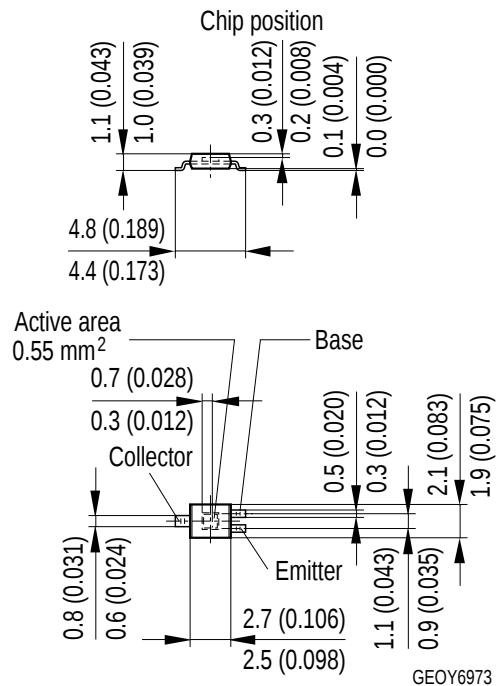
$$P_{\text{tot}} = f(T_A)$$

**Photocurrent**

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

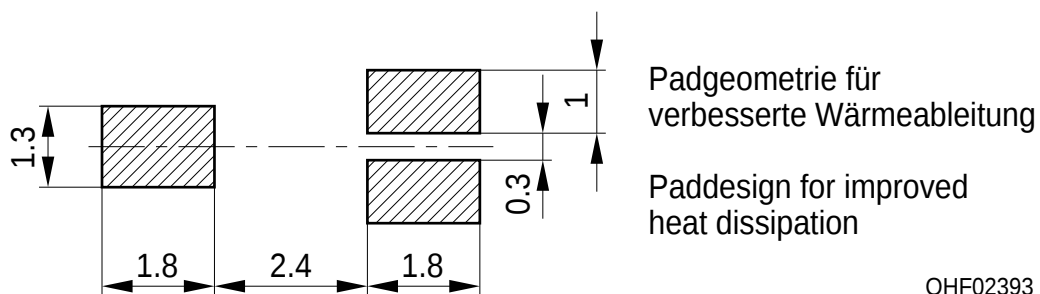


Maßzeichnung Package Outlines



Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

Empfohlenes Lötpaddesign Recommended Solderpad Design



Maße werden wie folgt angegeben: mm / Dimensions are specified as follows: mm.

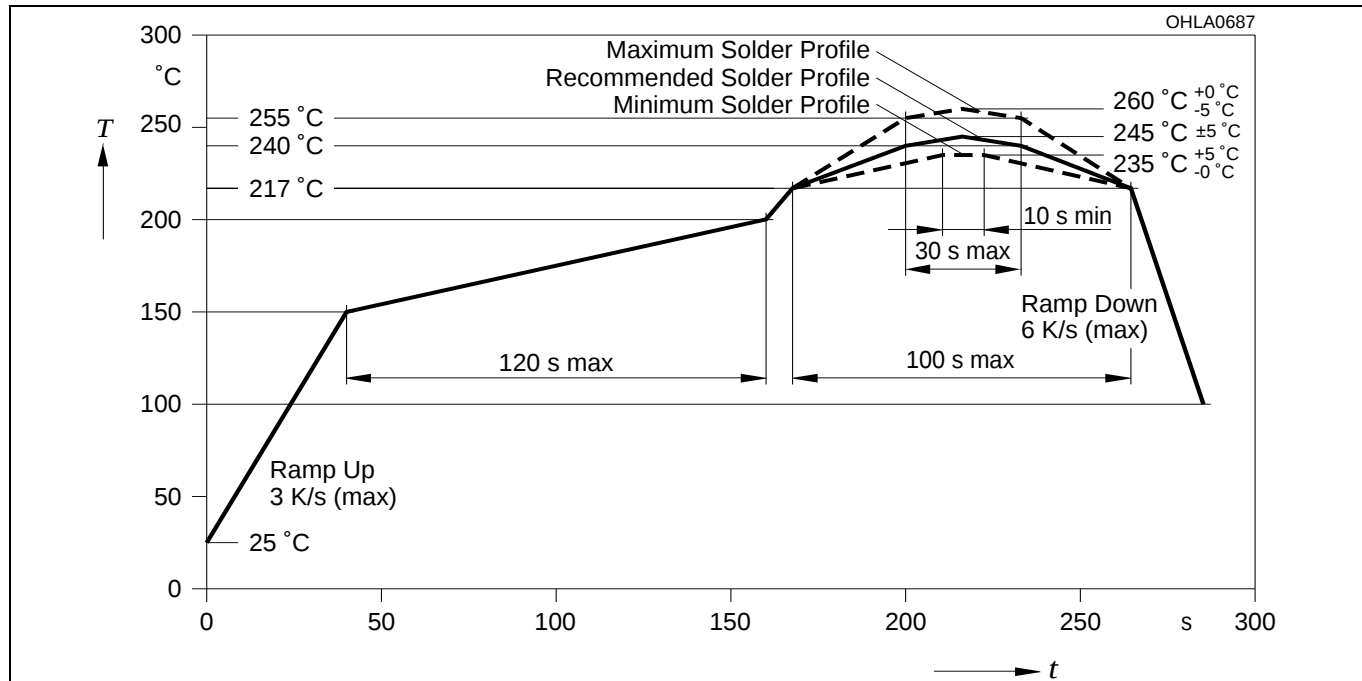
Lötbedingungen**Soldering Conditions****IR-Reflow Lötprofil für bleifreies Löten****IR Reflow Soldering Profile for lead free soldering**

Vorbehandlung nach JEDEC Level 4

Preconditioning acc. to JEDEC Level 4

(nach J-STD-020B)

(acc. to J-STD-020B)



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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.