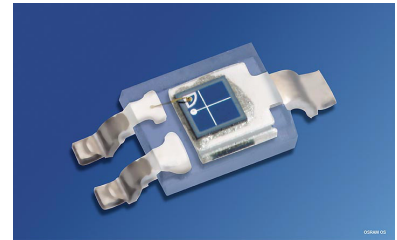


NPN-Silizium-Fototransistor
Silicon NPN Phototransistor
Lead (Pb) Free Product - RoHS Compliant

SFH 3401



Wesentliche Merkmale

- Speziell geeignet für Anwendungen im Bereich von 460 nm bis 1080 nm
- Hohe Linearität
- Nur gegurtet lieferbar

Anwendungen

- Umgebungslicht-Detektor
- Lichtschranken
- Industrieelektronik
- „Messen/Steuern/Regeln“

Features

- Especially suitable for applications from 460 nm to 1080 nm
- High linearity
- Available only on tape and reel

Applications

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

Typ Type	Bestellnummer Ordering Code	Fotostrom , ($E_e=0,1\text{mW/cm}^2, \lambda=950\text{nm}$ $V_{CE} = 5\text{ V}$) Photocurrent I_{pce} (μA)
SFH 3401	Q65110A2635	63...320
SFH 3401-2/3	Q65110A2644	100...320

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, $\tau < 10$ μ s 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.

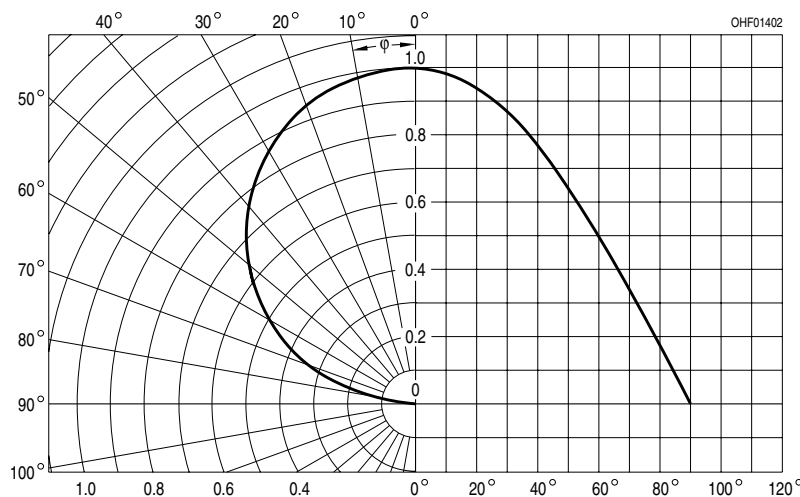
The phototransistors are grouped according to their spectral sensitivity and distinguished by arabian figures.

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}	63 ...125	100 ...200	160 ...320	μA
	I_{PCE}	1.65	2.6	4.2	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.

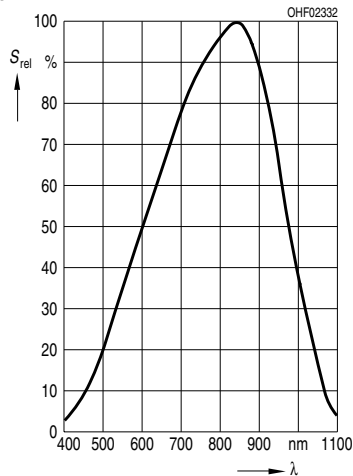
1) I_{PCEmin} is the min. photocurrent of the specified group.

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



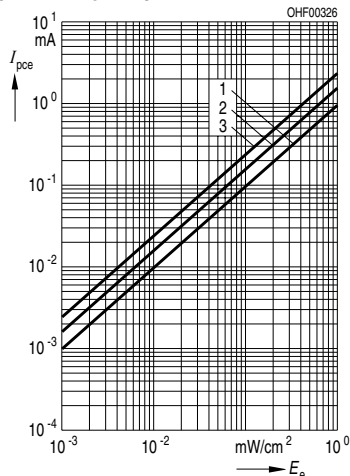
Rel. Spectral Sensitivity,

$S_{rel} = f(\lambda)$



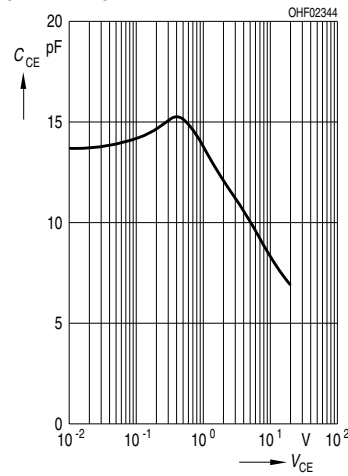
Photocurrent

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



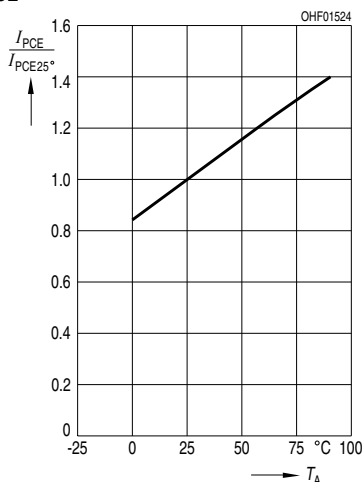
Collector-Emitter Capacitance

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



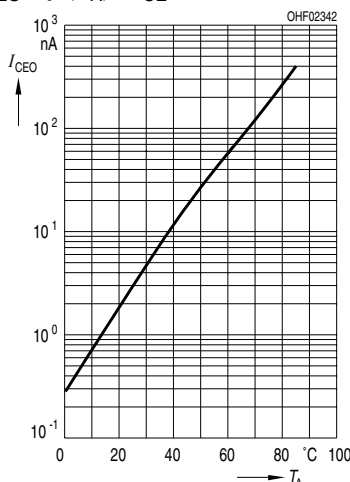
Photocurrent $I_{PCE} = f(T_A)$,

$V_{CE} = 5 V$, normalized to 25 °C



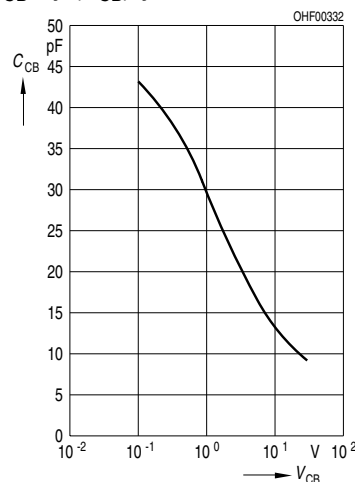
Dark Current

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



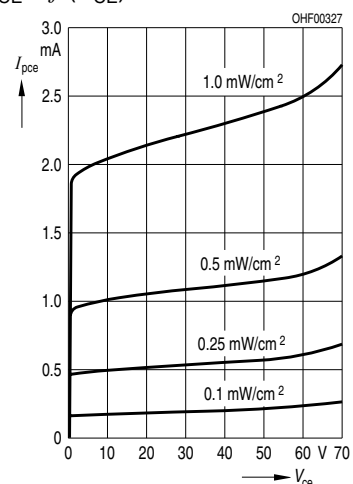
Collector-Base Capacitance

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



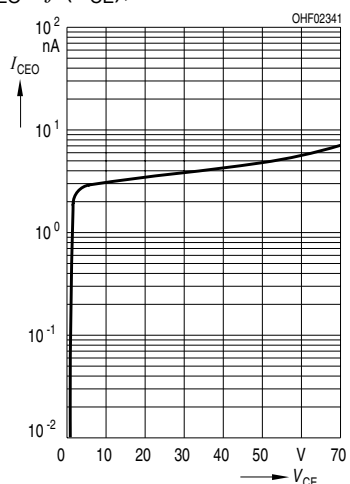
Photocurrent

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



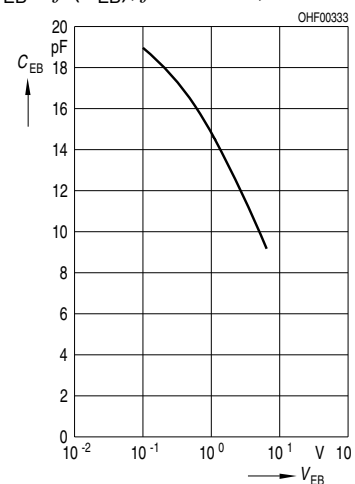
Dark Current

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



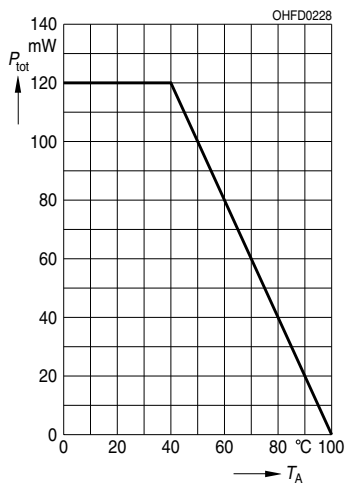
Emitter-Base Capacitance

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



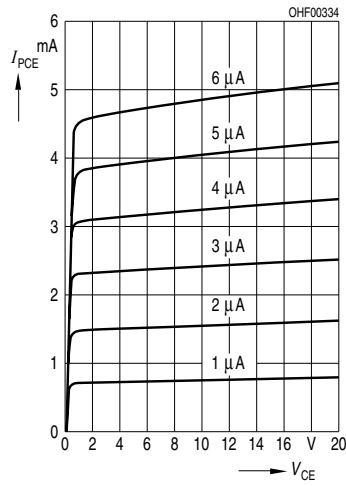
Total Power Dissipation

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

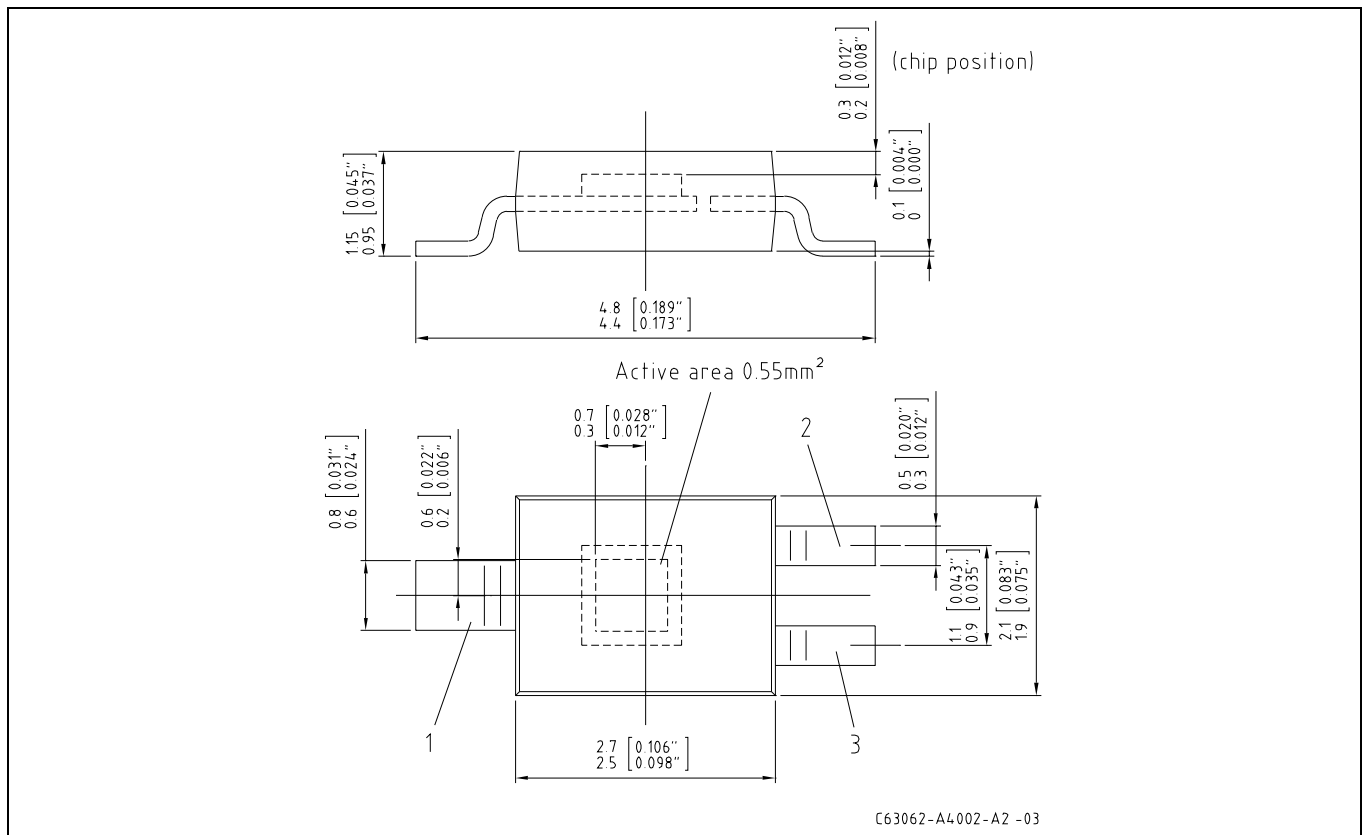


Photocurrent

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



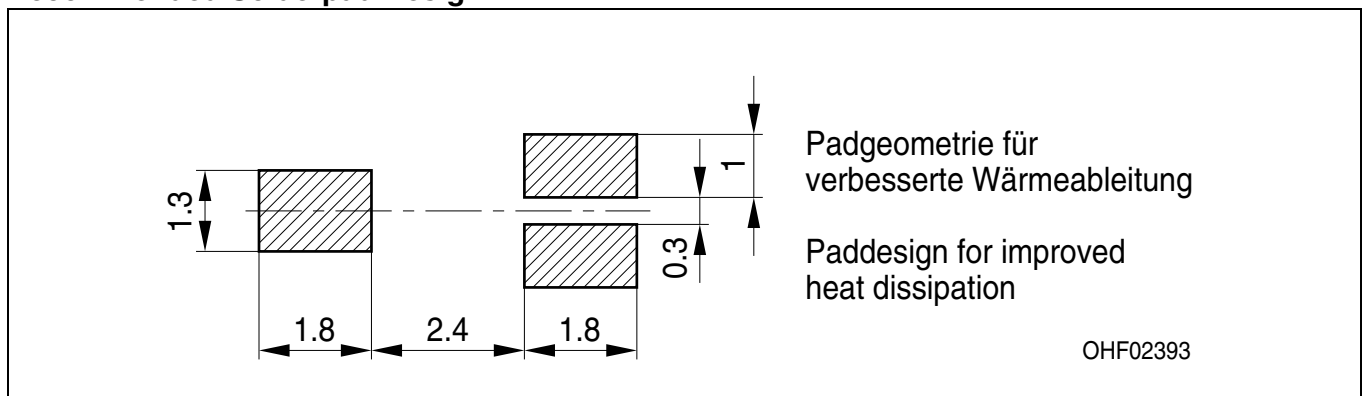
**Maßzeichnung
Package Outlines**



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

Anschlussbelegung	Pin 1 = Kollektor / collector
Pin configuration	Pin 2 = Basis / base
	Pin 3 = Emitter / emitter

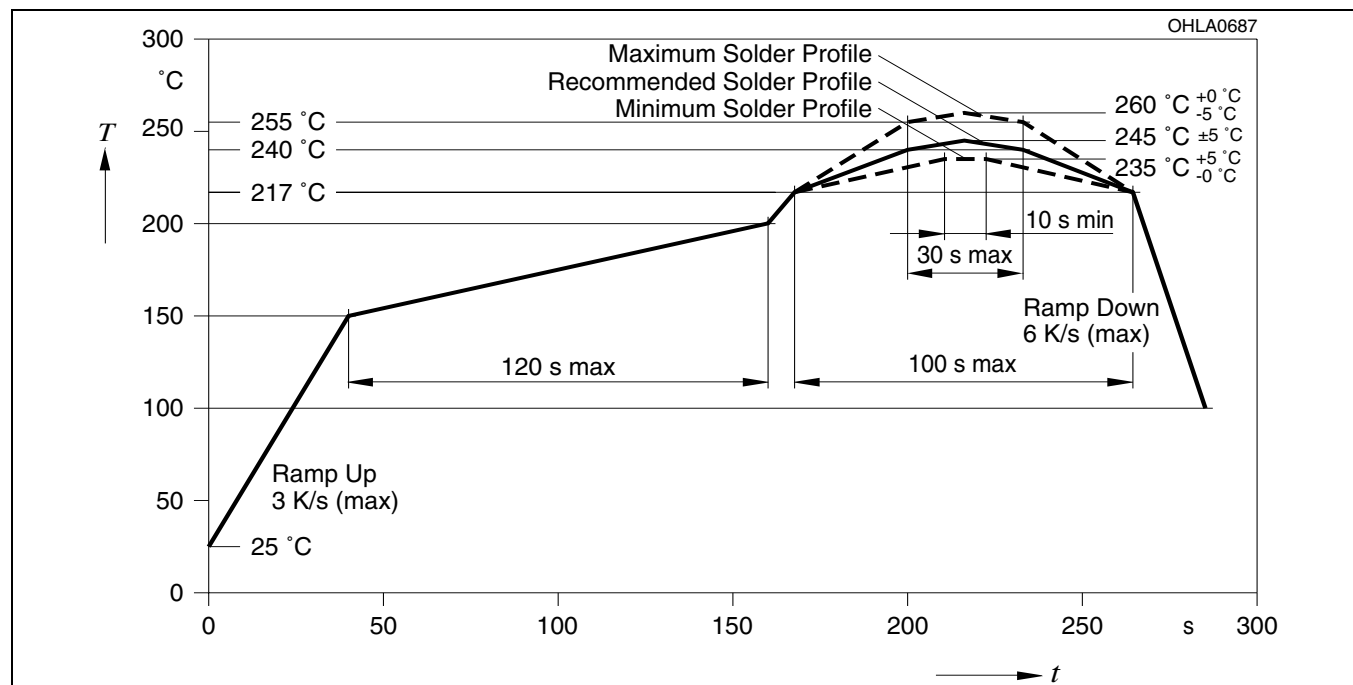
**Empfohlenes Lötpaddesign
Recommended Solderpad Design**



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)



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 Wernerwerkstrasse 2, D-93049 Regensburg
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