

**NPN-Silizium-Fototransistor im SMT SIDELED®-Gehäuse**  
**Silicon NPN Phototransistor in SMT SIDELED®-Package**  
**Lead (Pb) Free Product - RoHS Compliant**

**SFH 325**  
**SFH 325 FA**



SFH 325



SFH 325 FA

**Wesentliche Merkmale**

- Speziell geeignet für Anwendungen im Bereich von 450 nm bis 1120 nm (SFH 325) und bei 750 nm bis 1120 nm (SFH 325 FA)
- Hohe Linearität
- P-LCC-2 Gehäuse
- Gruppierbar lieferbar

**Anwendungen**

- Miniaturlichtschranken für Gleich- und Wechsellichtbetrieb
- Industrieelektronik
- „Messen/Steuern/Regeln“

**Features**

- Especially suitable for applications from 450 nm to 1120 nm (SFH 325) and from 750 nm to 1120 nm (SFH 325 FA)
- High linearity
- P-LCC-2 package
- Available in groups

**Applications**

- Miniature photointerrupters
- Industrial electronics
- For control and drive circuits

Type Type	Bestellnummer Ordering Code	Fotostrom , ( $E_e=0,1\text{mW/cm}^2, \lambda=950\text{nm } V_{CE} = 5 \text{ V}$ ) Photocurrent $I_{pce} (\mu\text{A})$
SFH 325 <sup>1)</sup>	Q65110A2486	> 16
SFH 325-3 <sup>1)</sup>	Q65110A2488	25-50
SFH 325-3/-4 <sup>1)</sup>	Q65110A2491	25-80
SFH 325-4 <sup>1)</sup>	Q65110A2484	40-80
SFH 325 FA <sup>1)</sup>	Q65110A2487	> 16
SFH 325 FA-3 <sup>1)</sup>	Q65110A2482	25-50
SFH 325 FA-3/-4 <sup>1)</sup>	Q65110A2490	25-80
SFH 325 FA-4 <sup>1)</sup>	Q65110A2485	40-80

<sup>1)</sup> Gruppierung erfolgt in Halbgruppen (siehe Seite 4), Verpackungseinheit = nur eine Halbgruppe / binning in half groups (see page 4), packing unit = only one half group

**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	$V_{CE}$	35	V
Kollektorstrom Collector current	$I_C$	15	mA
Kollektorspitzenstrom, $\tau < 10 \mu s$ Collector surge current	$I_{CS}$	75	mA
Verlustleistung, $T_A = 25 \text{ °C}$ Total power dissipation	$P_{tot}$	165	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
		SFH 325	SFH 325 FA	
Wellenlänge der max. Fotoempfindlichkeit Wavelength of max. sensitivity	$\lambda_{S\text{ max}}$	980	980	nm
Spektraler Bereich der Fotoempfindlichkeit $S = 10\%$ von $S_{\text{max}}$ Spectral range of sensitivity $S = 10\%$ of $S_{\text{max}}$	$\lambda$	450 ... 1120	750 ... 1120	nm
Bestrahlungsempfindliche Fläche ( $\varnothing 220\text{ }\mu\text{m}$ ) Radiant sensitive area	$A$	0.038	0.038	$\text{mm}^2$
Abmessung der Chipfläche Dimensions of chip area	$L \times B$ $L \times W$	$0.45 \times 0.45$	$0.45 \times 0.45$	$\text{mm} \times \text{mm}$
Halbwinkel Half angle	$\varphi$	$\pm 60$	$\pm 60$	Grad deg.
Kapazität, $V_{\text{CE}} = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$ Capacitance	$C_{\text{CE}}$	5.0	5.0	pF
Dunkelstrom Dark current $V_{\text{CE}} = 20\text{ V}$ , $E = 0$	$I_{\text{CEO}}$	1 ( $\leq 50$ )	1 ( $\leq 50$ )	nA

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

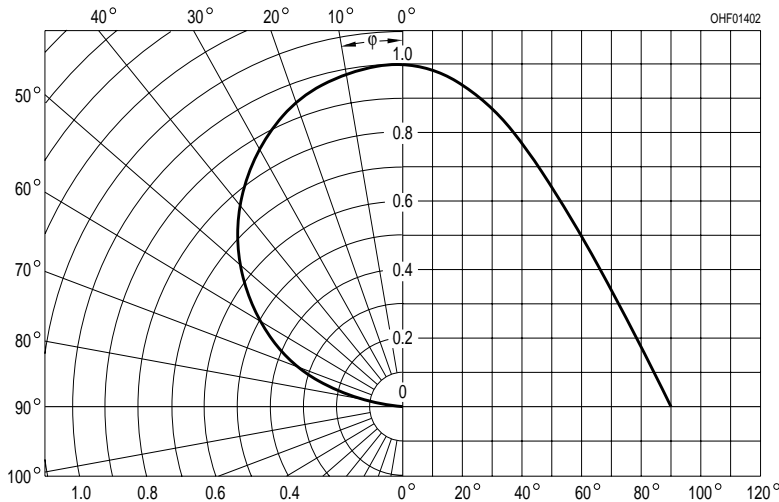
The phototransistors are grouped according to their spectral sensitivity and distinguished by arabian figures.

Bezeichnung Parameter	Symbol Symbol	Wert Value						Einheit Unit
		-2A	-2B	-3A	-3B	-4A	-4B	
Fotostrom, $\lambda = 950 \text{ nm}$ Photocurrent $E_e = 0.1 \text{ mW/cm}^2, V_{CE} = 5 \text{ V}$ <b>SFH 325:</b> $E_v = 1000 \text{ lx}$ , Normlicht/standard light A, $V_{CE} = 5 \text{ V}$	$I_{PCE \text{ min}}$ $I_{PCE \text{ max}}$  $I_{PCE}$	16 25  360	20 32  450	25 40  570	32 50  720	40 63  900	50 80  1140	$\mu\text{A}$ $\mu\text{A}$  $\mu\text{A}$
Anstiegszeit/Abfallzeit Rise and fall time $I_C = 1 \text{ mA}, V_{CC} = 5 \text{ V}, R_L = 1 \text{ k}\Omega$	$t_r, t_f$	6	6	7	7	8	8	$\mu\text{s}$
Kollektor-Emitter-Sättigungsspannung Collector-emitter saturation voltage $I_C = I_{PCE \text{ min}}^{1)} \times 0.3$ , $E_e = 0.1 \text{ mW/cm}^2$	$V_{CE \text{ sat}}$	150	150	150	150	150	150	mV

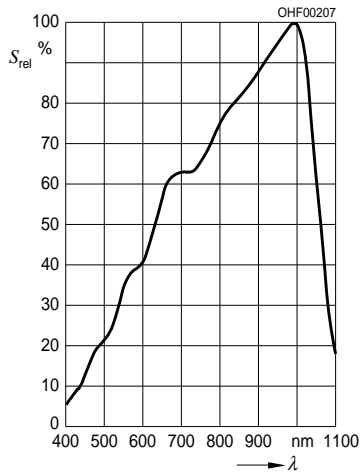
1)  $I_{PCE \text{ min}}$  ist der minimale Fotostrom der jeweiligen Gruppe.

1)  $I_{PCE \text{ min}}$  is the min. photocurrent of the specified group.

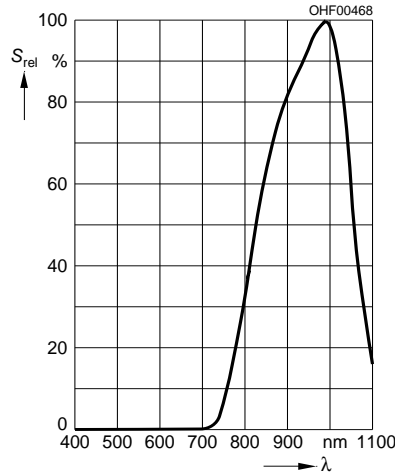
**Directional Characteristics**  $S_{\text{rel}} = f(\varphi)$



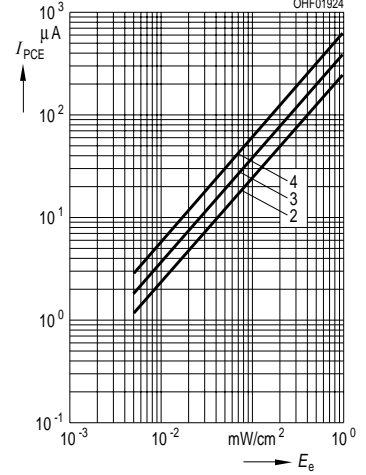
**Relative Spectral Sensitivity, SFH 325**  $S_{rel} = f(\lambda)$



**Relative Spectral Sensitivity, SFH 325 FA**  $S_{rel} = f(\lambda)$

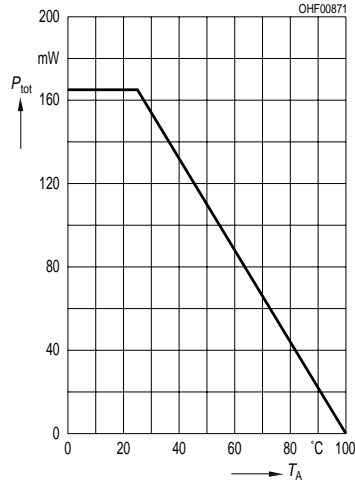


**Photocurrent**  $I_{PCE} = f(E_e), V_{CE} = 5 V$



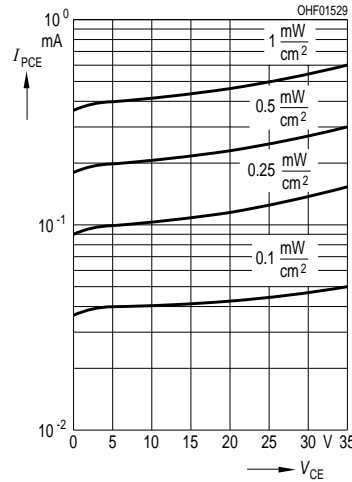
**Total Power Dissipation**

$P_{tot} = f(T_A)$



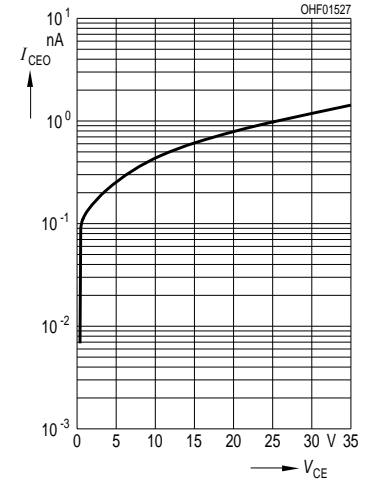
**Photocurrent**

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



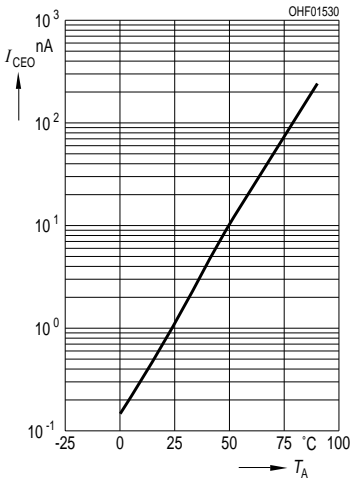
**Dark Current**

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



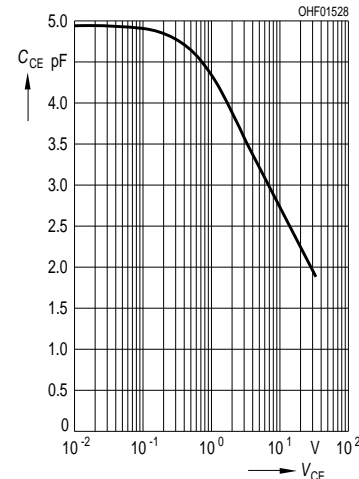
**Dark Current**

$I_{CEO} = f(T_A), V_{CE} = 5 V, E = 0$



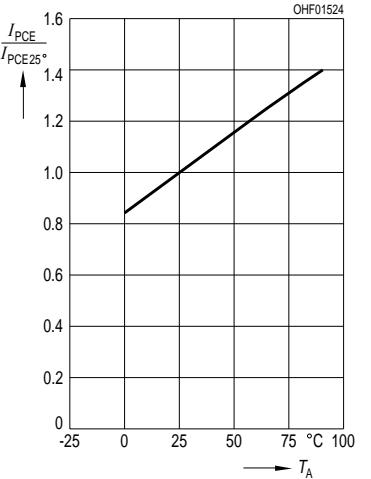
**Capacitance**

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



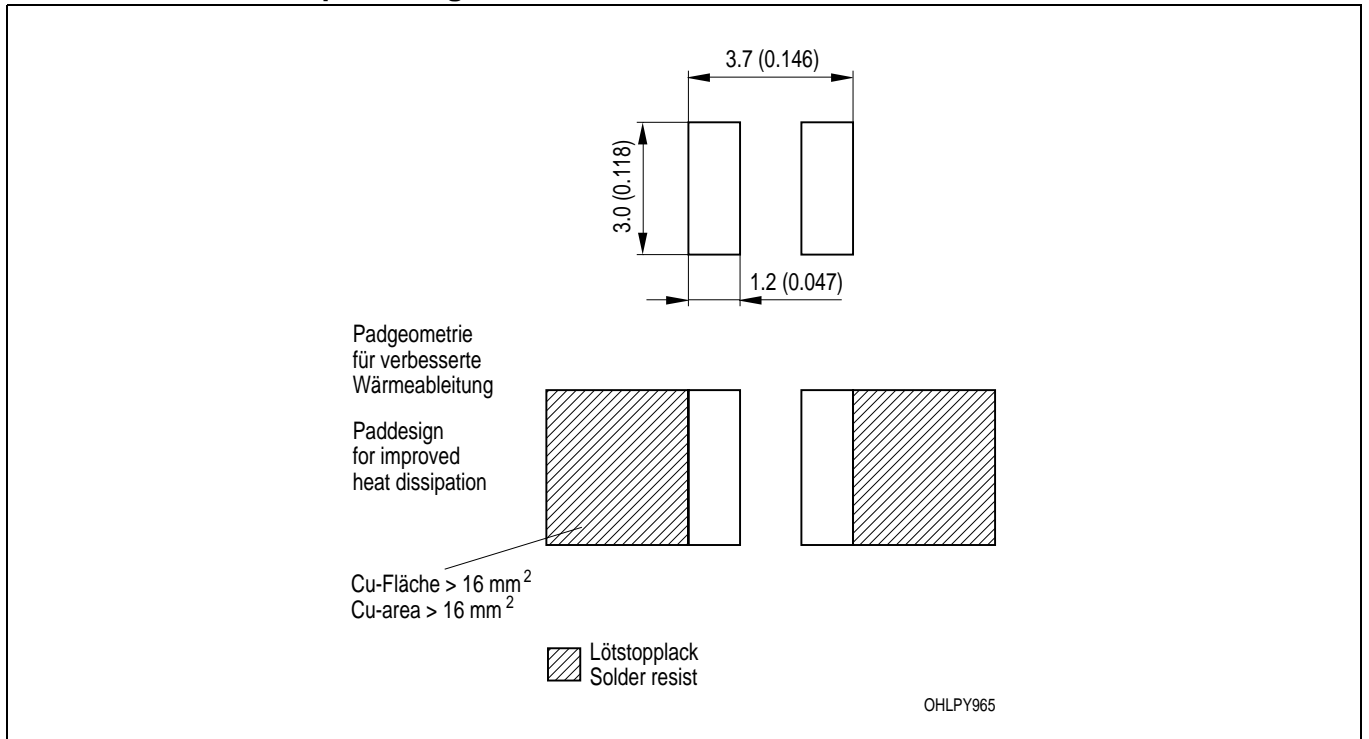
**Photocurrent**

$I_{PCE}/I_{PCE25} = f(T_A), V_{CE} = 5 V$





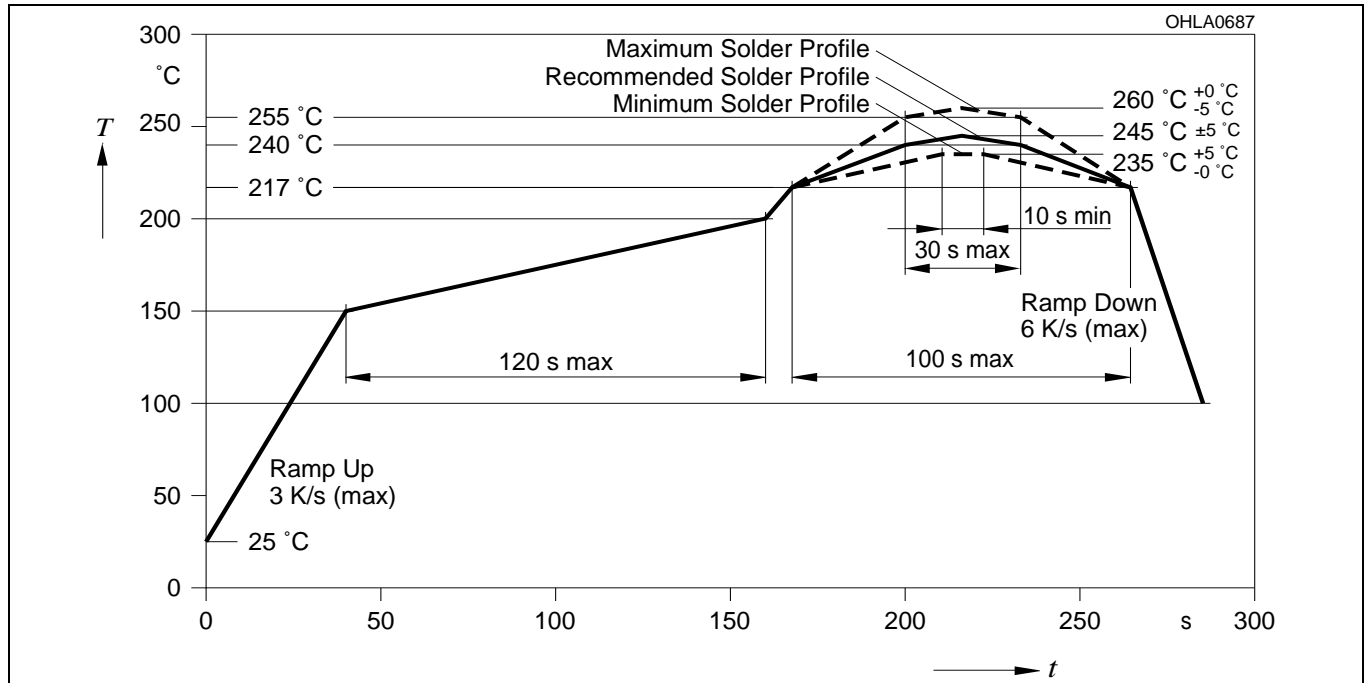
**Empfohlenes Lötpad Design**  
**Recommended Solderpad Design**



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

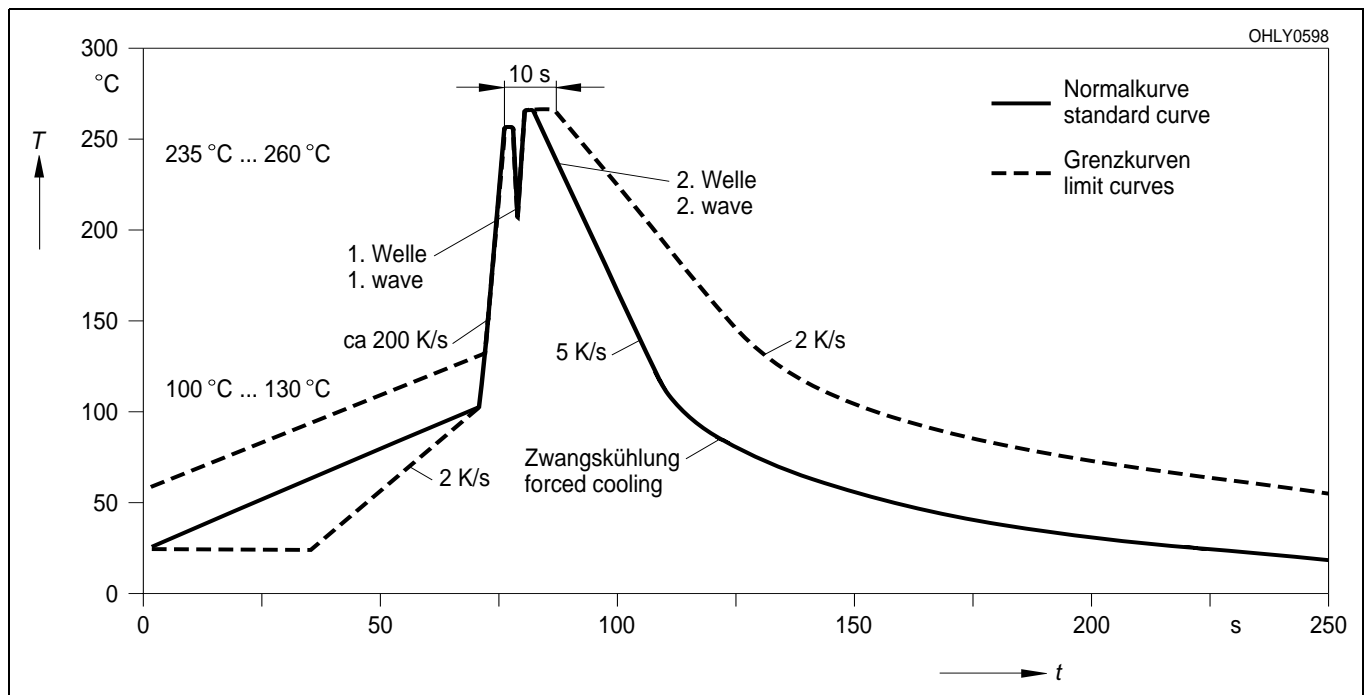
**Lötbedingungen**  
**Soldering Conditions**  
**Reflow Lötprofil für bleifreies Löten**  
**Reflow Soldering Profile for lead free soldering**

Vorbehandlung nach JEDEC Level 2  
 Preconditioning acc. to JEDEC Level 2  
 (nach J-STD-020C)  
 (acc. to J-STD-020C)



**Wellenlöten (TTW)**  
**TTW Soldering**

(nach CECC 00802)  
 (acc. to CECC 00802)





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