

**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<br>Type                  | Bestellnummer<br>Ordering Code | Fotostrom , ( $E_e=0,1\text{mW/cm}^2, \lambda=950\text{nm } V_{CE} = 5 \text{ V}$ )<br>Photocurrent<br>$I_{pce} (\mu\text{A})$ |
|-------------------------------|--------------------------------|--|
| 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<br>Parameter   | Symbol<br>Symbol  | Wert<br>Value  | Einheit<br>Unit |
|--|-------------------|----------------|-----------------|
| Betriebs- und Lagertemperatur<br>Operating and storage temperature range           | $T_{op}; T_{stg}$ | - 40 ... + 100 | °C              |
| Kollektor-Emitterspannung<br>Collector-emitter voltage                             | $V_{CE}$          | 35             | V               |
| Kollektorstrom<br>Collector current  | $I_C$             | 15             | mA              |
| Kollektorspitzenstrom, $\tau < 10 \mu s$<br>Collector surge current                | $I_{CS}$          | 75             | mA              |
| Verlustleistung, $T_A = 25 \text{ °C}$<br>Total power dissipation                  | $P_{tot}$         | 165            | mW              |
| Wärmewiderstand für Montage auf PC-Board<br>Thermal resistance for mounting on pcb | $R_{thJA}$        | 450            | K/W             |

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

## Characteristics

| Bezeichnung<br>Parameter   | Symbol<br>Symbol             | Wert<br>Value      |                    | Einheit<br>Unit              |
|--|------------------------------|--------------------|--------------------|------------------------------|
|  |                              | SFH 325            | SFH 325 FA         |                              |
| Wellenlänge der max. Fotoempfindlichkeit<br>Wavelength of max. sensitivity   | $\lambda_{S\text{ max}}$     | 980                | 980                | nm                           |
| Spektraler Bereich der Fotoempfindlichkeit<br>$S = 10\%$ von $S_{\text{max}}$<br>Spectral range of sensitivity<br>$S = 10\%$ of $S_{\text{max}}$ | $\lambda$                    | 450 ... 1120       | 750 ... 1120       | nm                           |
| Bestrahlungsempfindliche Fläche ( $\varnothing 220\text{ }\mu\text{m}$ )<br>Radiant sensitive area   | $A$                          | 0.038              | 0.038              | $\text{mm}^2$                |
| Abmessung der Chipfläche<br>Dimensions of chip area  | $L \times B$<br>$L \times W$ | $0.45 \times 0.45$ | $0.45 \times 0.45$ | $\text{mm} \times \text{mm}$ |
| Halbwinkel<br>Half angle   | $\varphi$                    | $\pm 60$           | $\pm 60$           | Grad<br>deg.                 |
| Kapazität, $V_{\text{CE}} = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$<br>Capacitance  | $C_{\text{CE}}$              | 5.0                | 5.0                | pF                           |
| Dunkelstrom<br>Dark current<br>$V_{\text{CE}} = 20\text{ V}$ , $E = 0$   | $I_{\text{CEO}}$             | 1 ( $\leq 50$ )    | 1 ( $\leq 50$ )    | nA                           |

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

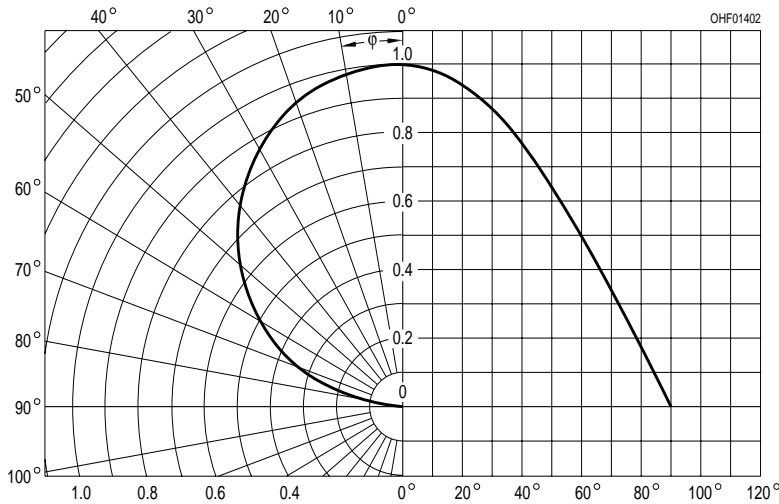
The phototransistors are grouped according to their spectral sensitivity and distinguished by arabian figures.

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

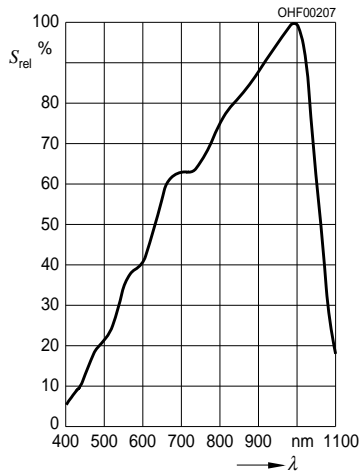
1)  $I_{PCE \text{ min}}$  ist der minimale Fotostrom der jeweiligen Gruppe.

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

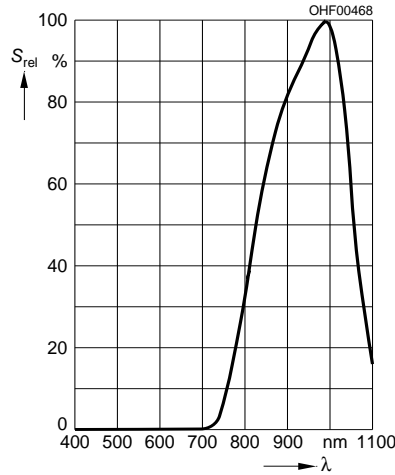
**Directional Characteristics**  $S_{\text{rel}} = f(\varphi)$



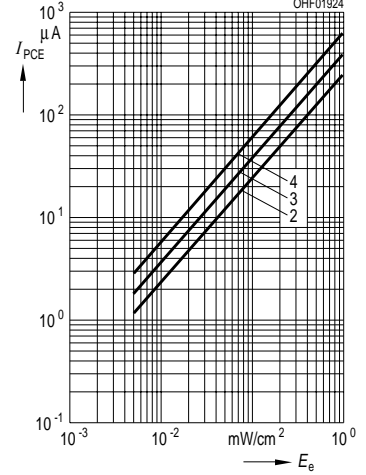
**Relative Spectral Sensitivity, SFH 325**  $S_{rel} = f(\lambda)$



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

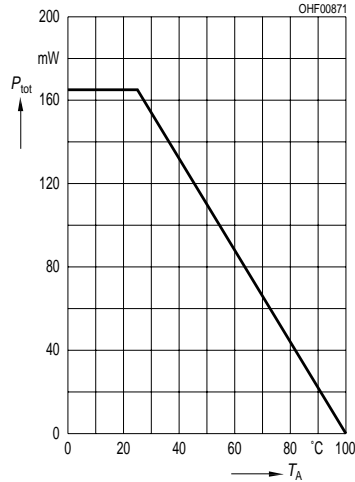


**Photocurrent**  $I_{PCE} = f(E_e), V_{CE} = 5 V$



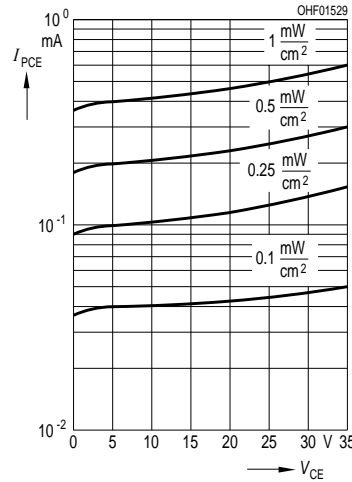
**Total Power Dissipation**

$P_{tot} = f(T_A)$



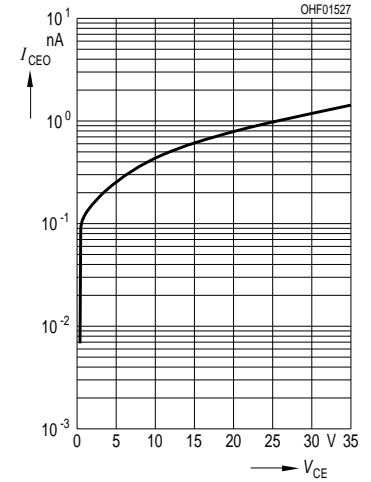
**Photocurrent**

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



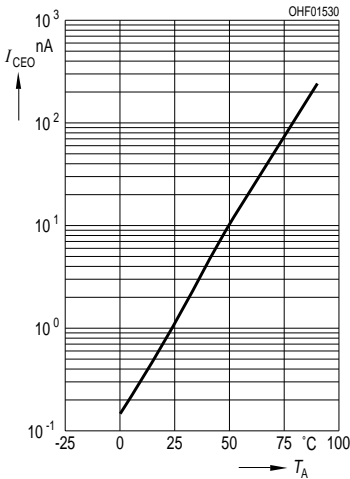
**Dark Current**

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



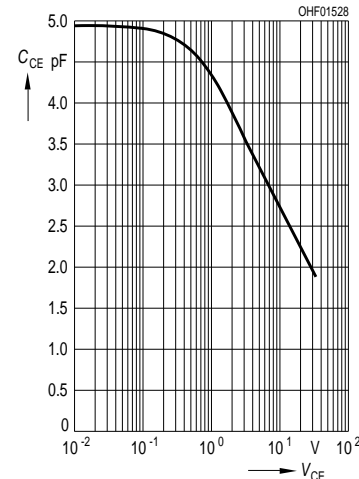
**Dark Current**

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



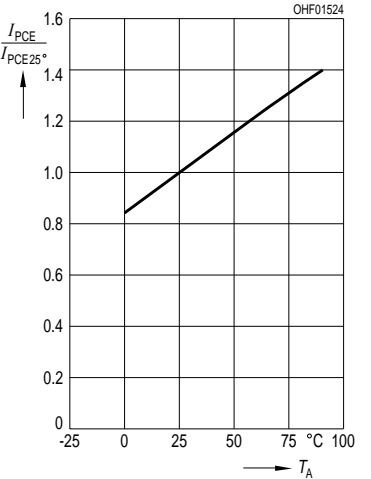
**Capacitance**

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

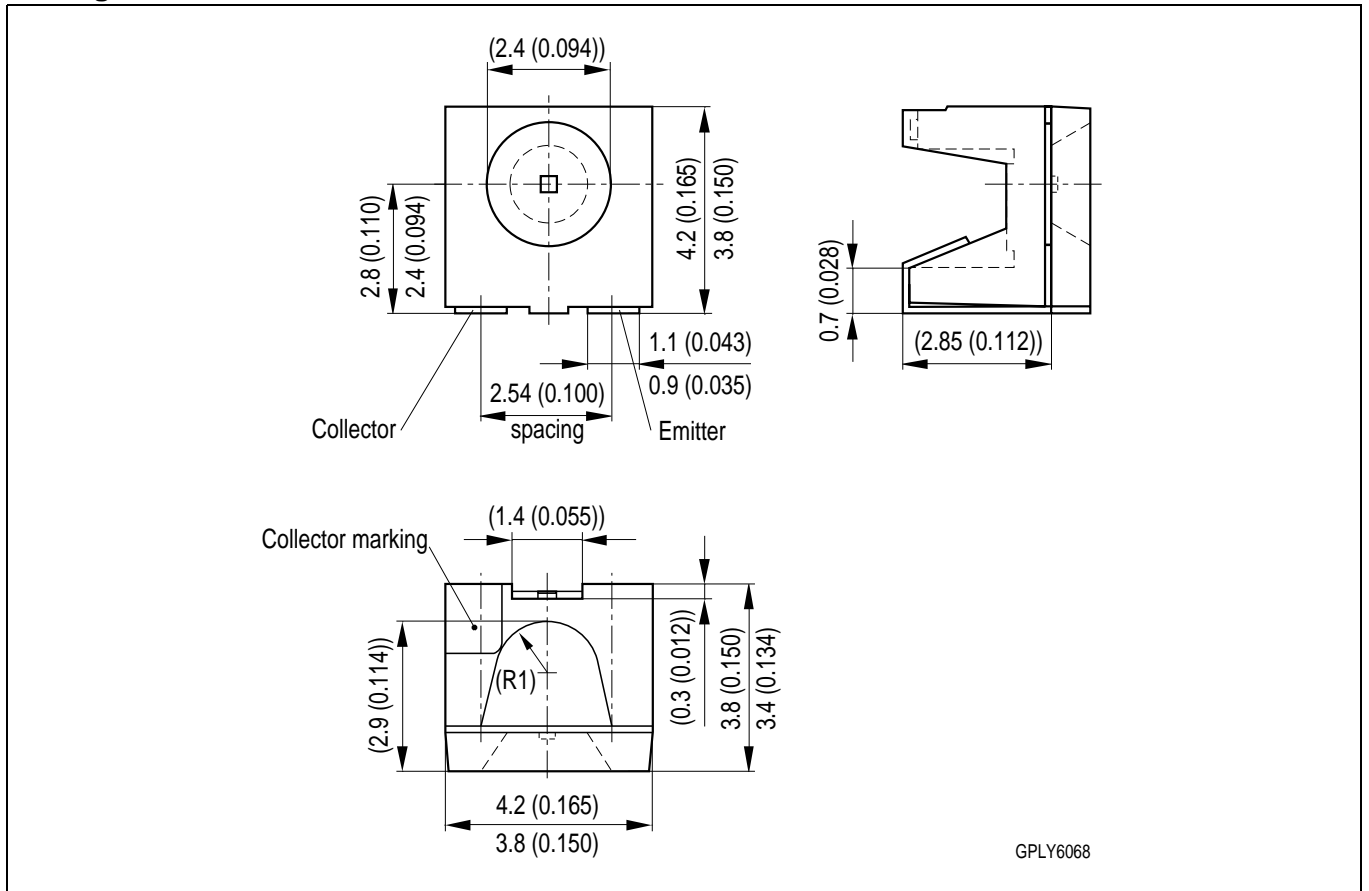


**Photocurrent**

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

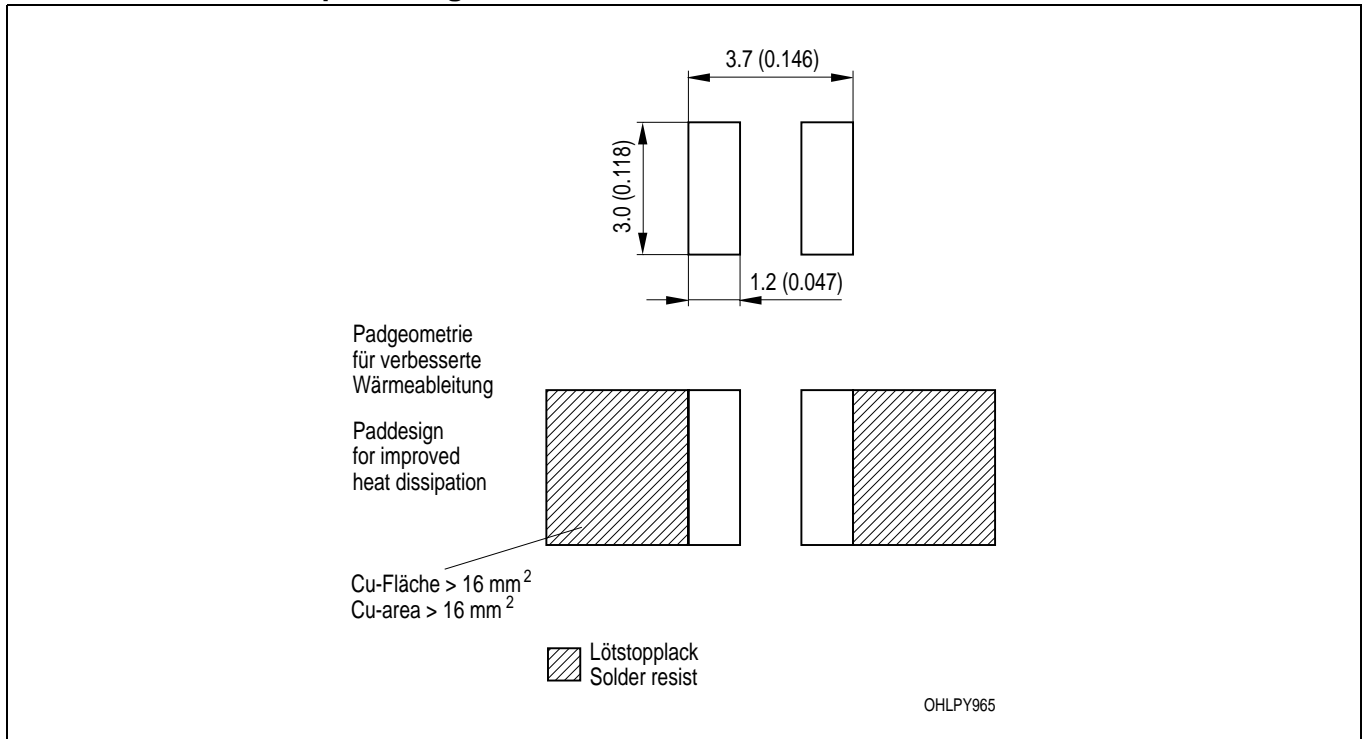


Maßzeichnung  
Package Outlines



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

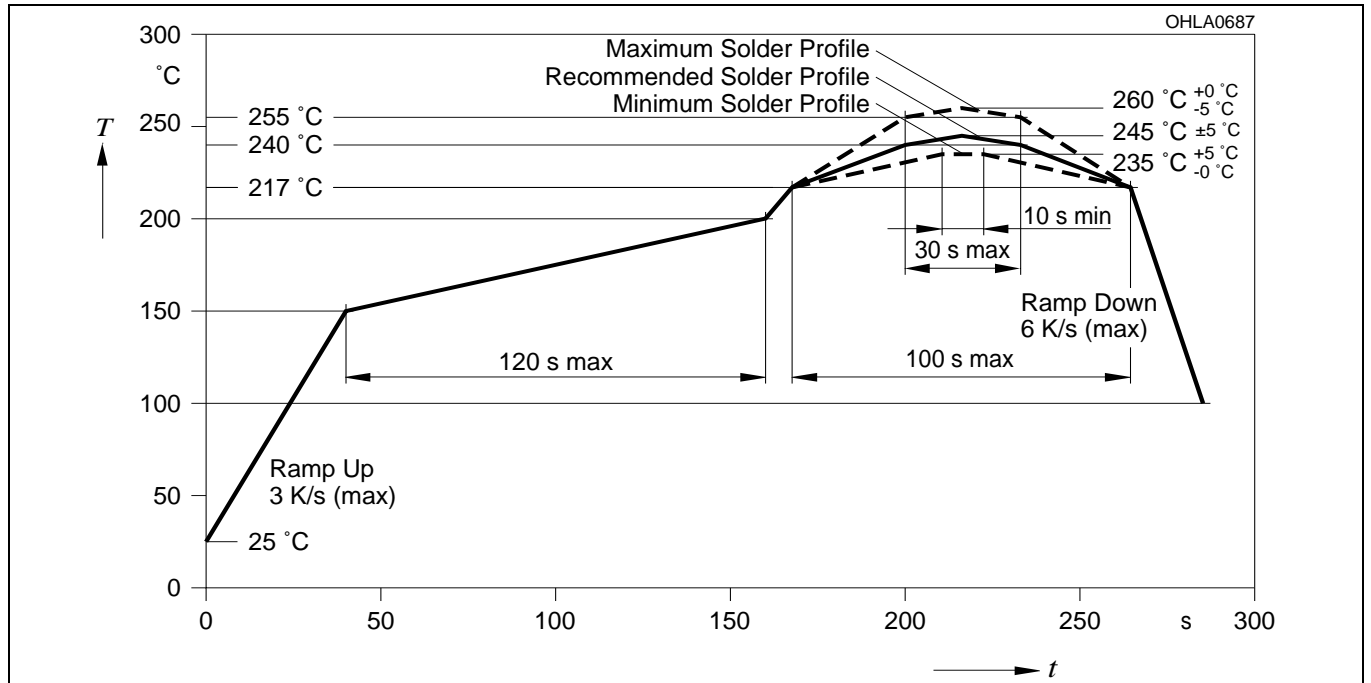
**Empfohlenes Lötpad Design**  
**Recommended Solderpad Design**



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

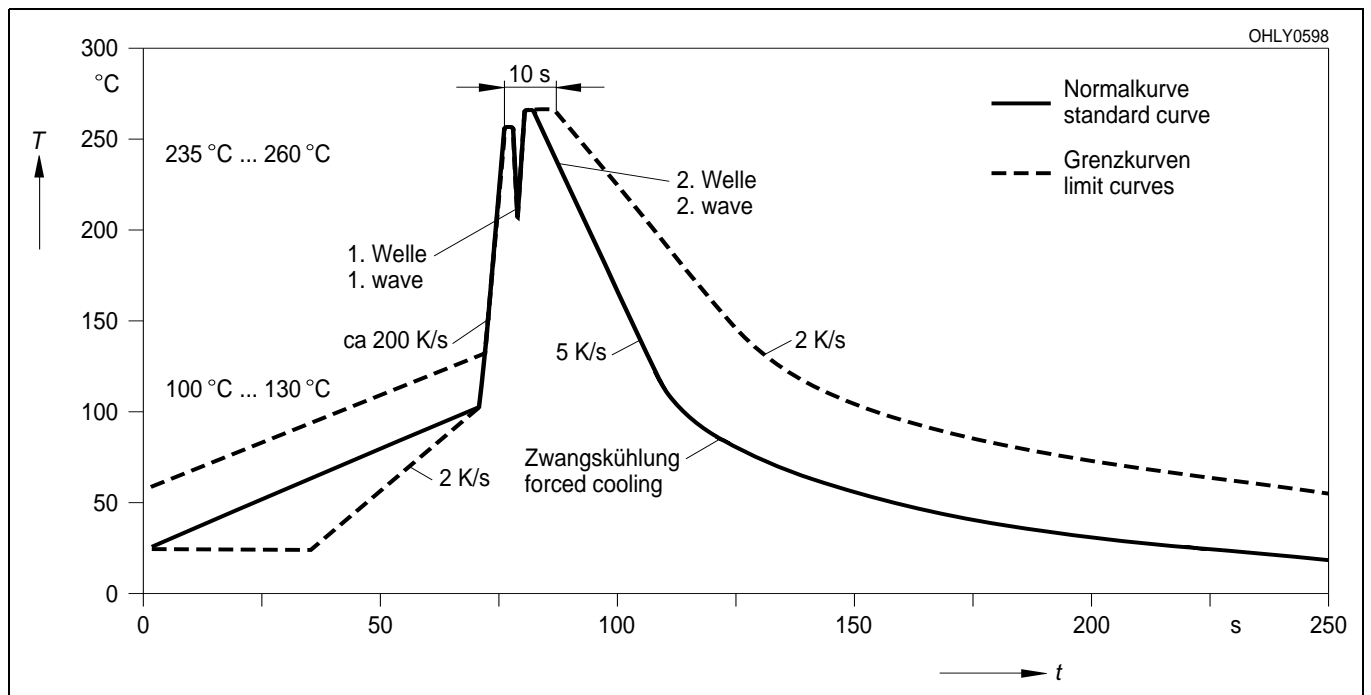
**Lötbedingungen**  
**Soldering Conditions**  
**Reflow Lötprofil für bleifreies Löten**  
**Reflow Soldering Profile for lead free soldering**

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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