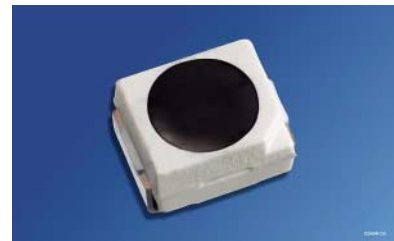


NPN-Silizium-Fototransistor im SMT TOPLED®-Gehäuse
Silicon NPN Phototransistor in SMT TOPLED®-Package
Lead (Pb) Free Product - RoHS Compliant

SFH 320
SFH 320 FA



SFH 320



SFH 320 FA

Wesentliche Merkmale

- Speziell geeignet für Anwendungen im Bereich von 450 nm bis 1150 nm (SFH 320) und 750 nm bis 1120 nm (SFH 320 FA)
- Hohe Linearität
- P-LCC-2 Gehäuse
- Gruppiert lieferbar
- Für alle Lötverfahren geeignet.

Features

- Especially suitable for applications from 450 nm to 1150 nm (SFH 320) and 750 nm to 1120 nm (SFH 320 FA)
- High linearity
- P-LCC-2 package
- Available in groups
- Suitable for all soldering methods.

Anwendungen

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

Applications

- Miniature 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 320 | Q65110A2471 | > 16 |
| SFH 320-3 | Q65110A2469 | 25-50 |
| SFH 320-3/-4 | Q65110A1781 | 25-80 |
| SFH 320-4 | Q65110A2510 | 40-80 |
| SFH 320 FA | Q65110A2472 | > 16 |
| SFH 320 FA-3 | Q65110A2470 | 25-50 |
| SFH 320 FA-3/-4 | Q65110A2475 | 25-80 |
| SFH 320 FA-4 | Q65110A1836 | 40-80 |

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 320 | SFH 320 FA | |
| Wellenlänge der max. Fotoempfindlichkeit Wavelength of max. sensitivity | $\lambda_{S_{\max}}$ | 980 | 980 | nm |
| Spektraler Bereich der Fotoempfindlichkeit $S = 10\%$ von S_{\max} Spectral range of sensitivity $S = 10\%$ of S_{\max} | λ | 450 ... 1150 | 750 ... 1120 | nm |
| Bestrahlungsempfindliche Fläche ($\varnothing 220\text{ }\mu\text{m}$) Radiant sensitive area | A | 0.038 | 0.038 | mm^2 |
| Abmessung der Chipfläche Dimensions of chip area | $L \times B$ $L \times W$ | 0.45×0.45 | 0.45×0.45 | $\text{mm} \times \text{m}$ m |
| Halbwinkel Half angle | φ | ± 60 | ± 60 | Grad deg. |
| Kapazität, $V_{\text{CE}} = 0\text{ V}$, $f = 1\text{ MHz}$, $E = 0$ Capacitance | C_{CE} | 5.0 | 5.0 | pF |
| Dunkelstrom Dark current $V_{\text{CE}} = 20\text{ V}$, $E = 0$ | I_{CEO} | 1 (≤ 50) | 1 (≤ 50) | nA |

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

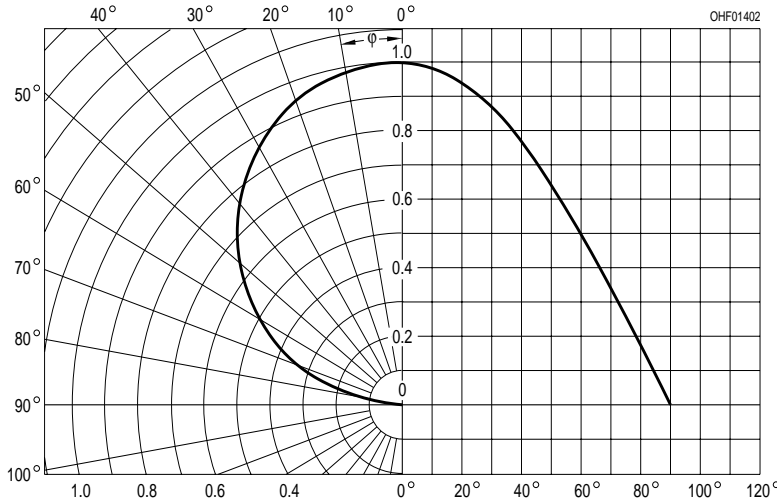
The phototransistors are grouped according to their spectral sensitivity and distinguished by arabian figures.

| Bezeichnung Parameter | Symbol Symbol | Wert Value | | | | Einheit Unit |
|--|------------------|----------------|-----------|-----------|-----------|-----------------|
| | | SFH 320 /FA | -2 | -3 | -4 | |
| Fotostrom, $\lambda = 950 \text{ nm}$ Photocurrent $E_e = 0.1 \text{ mW/cm}^2, V_{CE} = 5 \text{ V}$ SFH 320: $E_v = 1000 \text{ lx}$, Normlicht/standard light A, $V_{CE} = 5 \text{ V}$ | I_{PCE} | ≥ 16 | 16 ... 32 | 25 ... 50 | 40 ... 80 | μA |
| | I_{PCE} | – | 420 | 650 | 1000 | μA |
| 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 | 7 | 6 | 7 | 8 | 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} | 150 | 150 | 150 | 150 | mV |

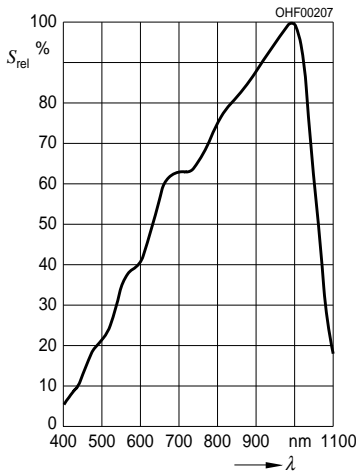
1) I_{PCEmin} ist der minimale Fotostrom der jeweiligen Gruppe.

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

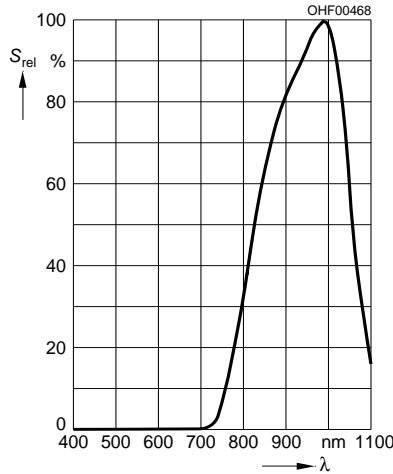
Directional Characteristics $S_{rel} = f(\varphi)$



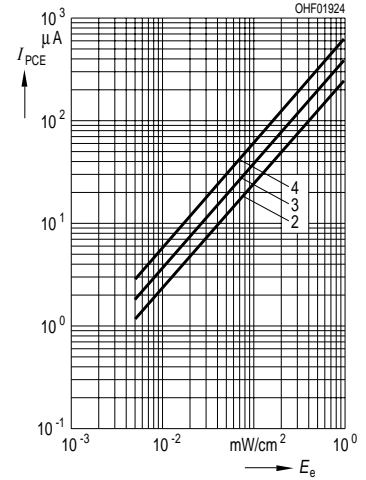
Relative Spectral Sensitivity, SFH 320
 $S_{rel} = f(\lambda)$



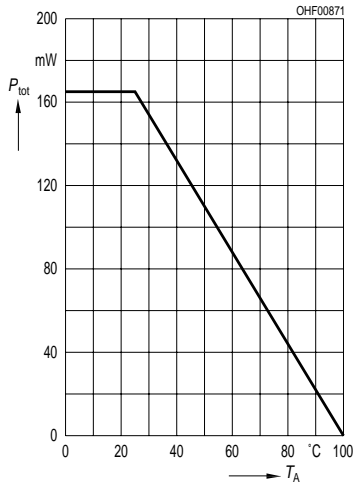
Relative Spectral Sensitivity, SFH 320 FA
 $S_{rel} = f(\lambda)$



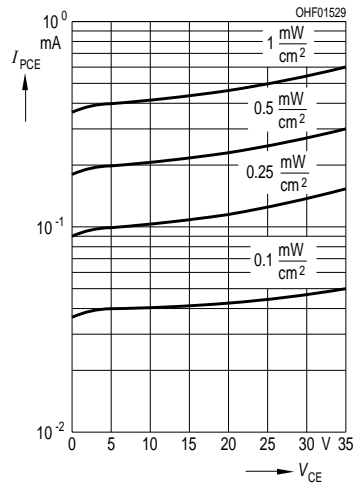
Photocurrent
 $I_{PCE} = f(E_e), V_{CE} = 5 V$



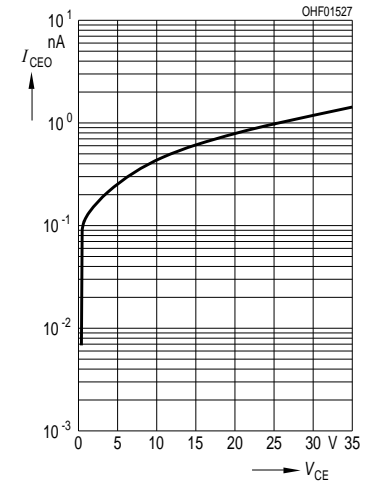
Total Power Dissipation
 $P_{tot} = f(T_A)$



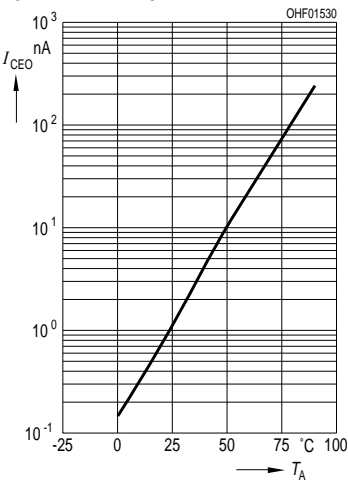
Photocurrent
 $I_{PCE} = f(V_{CE}), E_e = \text{Parameter}$



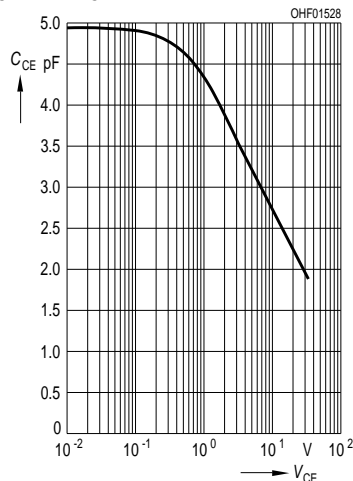
Dark Current
 $I_{CEO} = f(V_{CE}), E = 0$



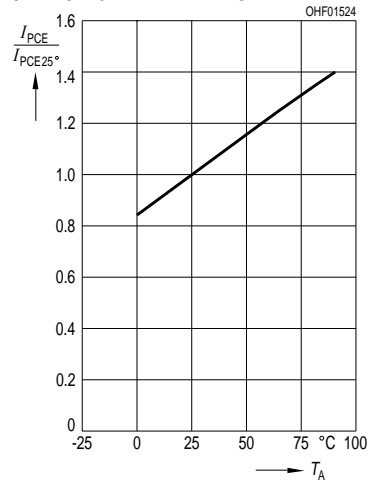
Dark Current
 $I_{CEO} = f(T_A), V_{CE} = 5 V, E = 0$



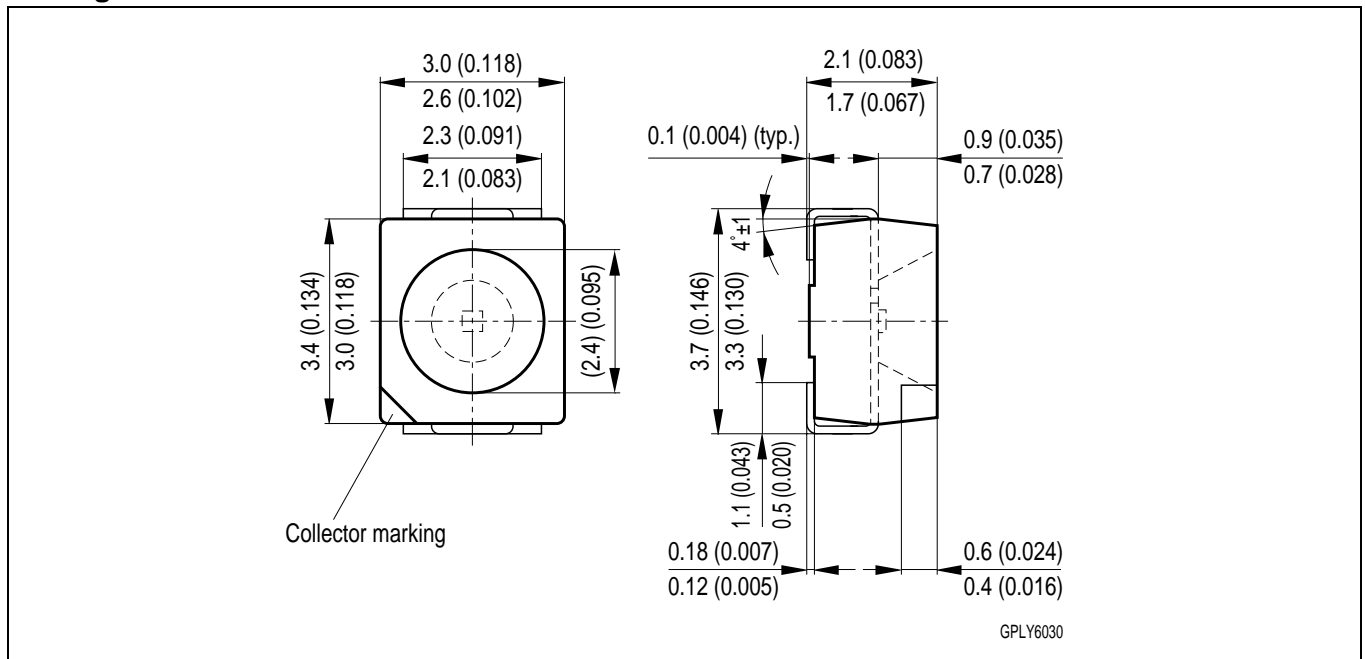
Capacitance
 $C_{CE} = f(V_{CE}), f = 1 \text{ MHz}, E = 0$



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

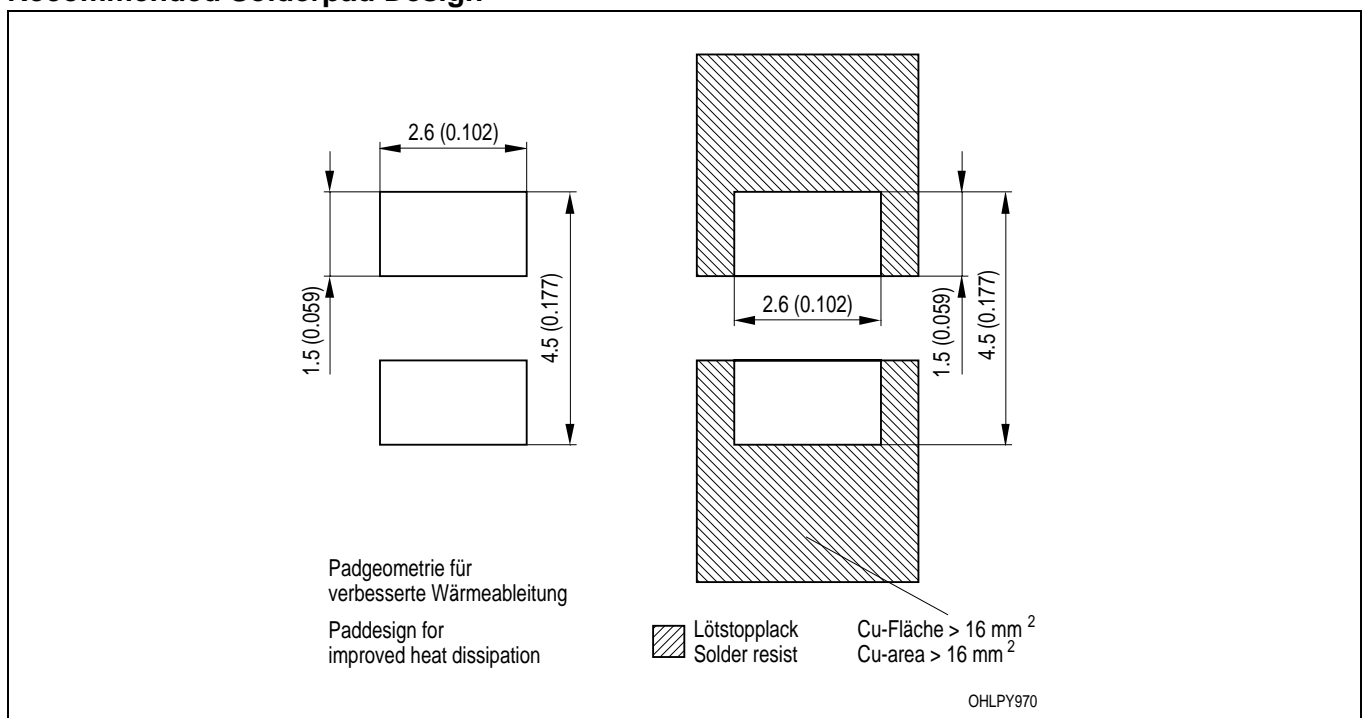


**Maßzeichnung
Package Outlines**



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

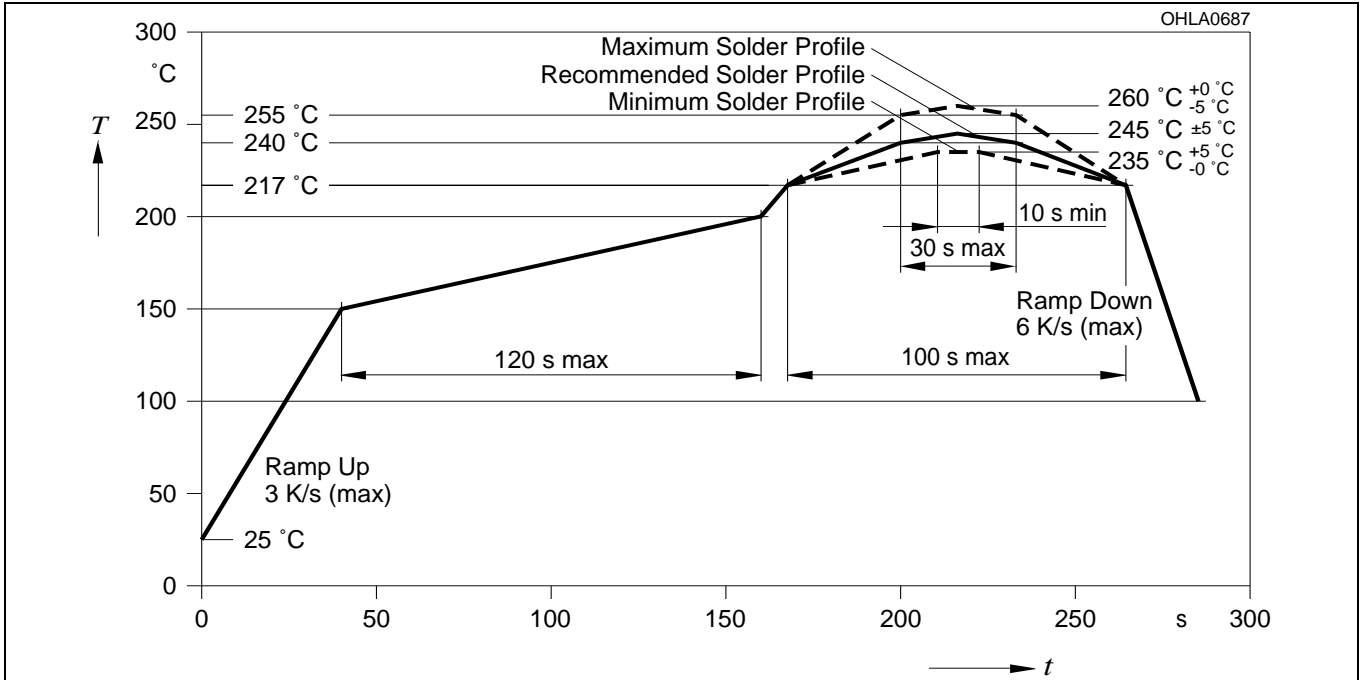
**Empfohlenes Lötpaddesign
Recommended Solderpad Design**



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

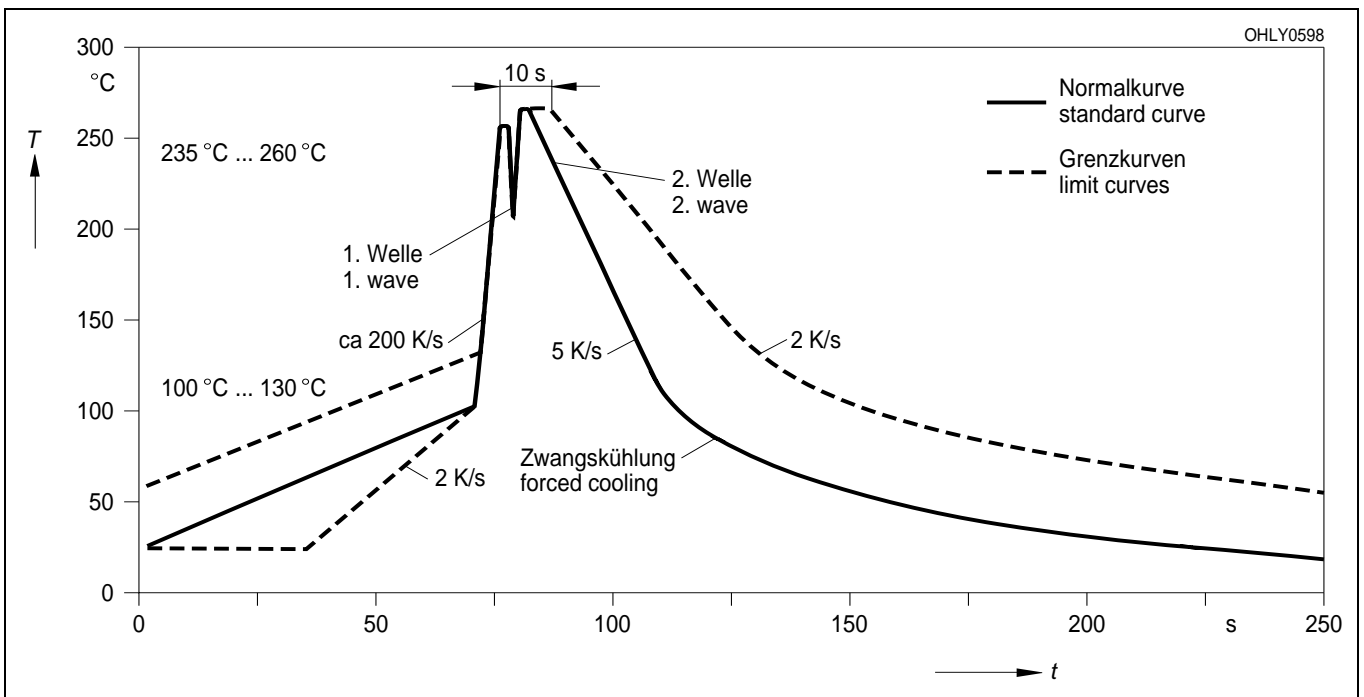
Lötbedingungen
Soldering Conditions
Reflow Lötprofil für bleifreies Löten
Reflow Soldering Profile for lead free soldering

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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