

**IR-Lumineszenzdiode (850 nm) mit hoher Ausgangsleistung**  
**High Power Infrared Emitter (850 nm)**  
**Lead (Pb) Free Product - RoHS Compliant**  
**SFH 4253**



**Wesentliche Merkmale**

- Infrarot LED mit hoher Ausgangsleistung
- Kurze Schaltzeiten

**Anwendungen**

- Infrarotbeleuchtung für Kameras
- IR-Datenübertragung
- Sensorik

**Sicherheitshinweise**

Je nach Betriebsart emittieren diese Bauteile hochkonzentrierte, nicht sichtbare Infrarot-Strahlung, die gefährlich für das menschliche Auge sein kann. Produkte, die diese Bauteile enthalten, müssen gemäß den Sicherheitsrichtlinien der IEC-Normen 60825-1 und 62471 behandelt werden.

**Features**

- High Power Infrared LED
- Short switching times

**Applications**

- Infrared Illumination for cameras
- IR Data Transmission
- Optical sensors

**Safety Advices**

Depending on the mode of operation, these devices emit highly concentrated non visible infrared light which can be hazardous to the human eye. Products which incorporate these devices have to follow the safety precautions given in IEC 60825-1 and IEC 62471.

| <b>Type</b><br><b>Type</b> | <b>Bestellnummer</b><br><b>Ordering Code</b> | <b>Strahlstärkegruppierung<sup>1)</sup></b> ( $I_F = 70 \text{ mA}$ , $t_p = 20 \text{ ms}$ )<br><b>Radiant Intensity Grouping<sup>1)</sup></b><br>$I_e \text{ (mW/sr)}$ |
|----------------------------|--|--|
| SFH 4253                   | Q65110A6657                                  | $\geq 4$ (typ. 11)   |

<sup>1)</sup> gemessen bei einem Raumwinkel  $\Omega = 0.01 \text{ sr}$  / measured at a solid angle of  $\Omega = 0.01 \text{ sr}$

**Grenzwerte** ( $T_A = 25\text{ °C}$ )**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              |
| Sperrspannung<br>Reverse voltage  | $V_R$             | 5              | V               |
| Vorwärtsgleichstrom<br>Forward current  | $I_F$             | 70             | mA              |
| Stoßstrom, $t_p = 100\ \mu\text{s}$ , $D = 0$<br>Surge current  | $I_{FSM}$         | 700            | mA              |
| Verlustleistung<br>Power dissipation  | $P_{tot}$         | 140            | mW              |
| Wärmewiderstand Sperrschicht - Umgebung bei<br>Montage auf FR4 Platine, Padgröße je $16\ \text{mm}^2$<br>Thermal resistance junction - ambient mounted<br>on PC-board (FR4), padsize $16\ \text{mm}^2$ each | $R_{thJA}$        | 500            | K/W             |
| Wärmewiderstand Sperrschicht - Lötstelle bei<br>Montage auf Metall-Block<br>Thermal resistance junction - soldering point,<br>mounted on metal block  | $R_{thJS}$        | 280            | K/W             |

**Kennwerte** ( $T_A = 25\text{ °C}$ )**Characteristics**

| Bezeichnung<br>Parameter  | Symbol<br>Symbol     | Wert<br>Value | Einheit<br>Unit |
|---|----------------------|---------------|-----------------|
| Wellenlänge der Strahlung<br>Wavelength at peak emission<br>$I_F = 50\ \text{mA}$                             | $\lambda_{peak}$     | 860           | nm              |
| Centroid-Wellenlänge der Strahlung<br>Centroid wavelength<br>$I_F = 50\ \text{mA}$                            | $\lambda_{centroid}$ | 850           | nm              |
| Spektrale Bandbreite bei 50% von $I_{max}$<br>Spectral bandwidth at 50% of $I_{max}$<br>$I_F = 50\ \text{mA}$ | $\Delta\lambda$      | 42            | nm              |
| Abstrahlwinkel<br>Half angle  | $\varphi$            | $\pm 60$      | Grad<br>deg.    |
| Aktive Chipfläche<br>Active chip area   | $A$                  | 0.04          | $\text{mm}^2$   |

**Kennwerte** ( $T_A = 25\text{ °C}$ )  
**Characteristics** (cont'd)

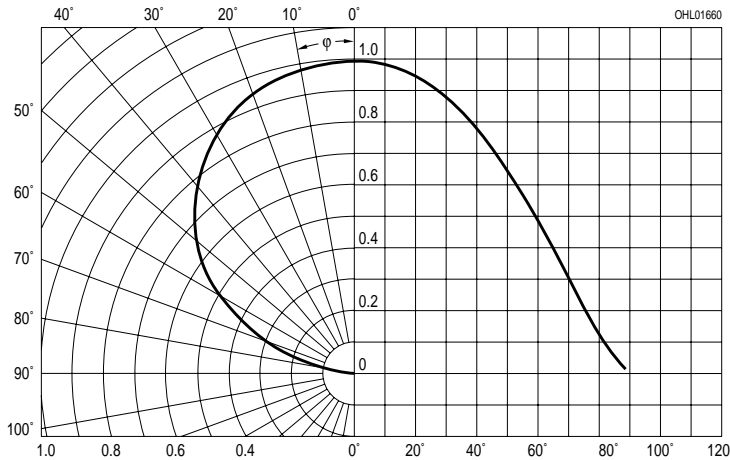
| Bezeichnung<br>Parameter  | Symbol<br>Symbol             | Wert<br>Value                      | Einheit<br>Unit |
|---|------------------------------|------------------------------------|-----------------|
| Abmessungen der aktiven Chipfläche<br>Dimension of the active chip area   | $L \times B$<br>$L \times W$ | $0.2 \times 0.2$                   | mm <sup>2</sup> |
| Schaltzeiten, $I_e$ von 10% auf 90% und von 90% auf 10%, bei $I_F = 50\text{ mA}$ , $R_L = 50\ \Omega$<br>Switching times, $I_e$ from 10% to 90% and from 90% to 10%, $I_F = 50\text{ mA}$ , $R_L = 50\ \Omega$ | $t_r$ , $t_f$                | 10                                 | ns              |
| Durchlassspannung<br>Forward voltage<br>$I_F = 50\text{ mA}$ , $t_p = 20\text{ ms}$<br>$I_F = 500\text{ mA}$ , $t_p = 100\ \mu\text{s}$   | $V_F$<br>$V_F$               | 1.5 (< 1.9)<br>2.4 (< 3.0)         | V<br>V          |
| Sperrstrom<br>Reverse current   | $I_R$                        | not designed for reverse operation | $\mu\text{A}$   |
| Gesamtstrahlungsfluss<br>Total radiant flux<br>$I_F = 70\text{ mA}$ , $t_p = 20\text{ ms}$  | $\Phi_{e\text{ typ}}$        | 33                                 | mW              |
| Temperaturkoeffizient von $I_e$ bzw. $\Phi_e$ ,<br>$I_F = 50\text{ mA}$<br>Temperature coefficient of $I_e$ or $\Phi_e$ , $I_F = 50\text{ mA}$  | $TC_I$                       | - 0.5                              | %/K             |
| Temperaturkoeffizient von $V_F$ , $I_F = 50\text{ mA}$<br>Temperature coefficient of $V_F$ , $I_F = 50\text{ mA}$   | $TC_V$                       | - 0.7                              | mV/K            |
| Temperaturkoeffizient von $\lambda$ , $I_F = 50\text{ mA}$<br>Temperature coefficient of $\lambda$ , $I_F = 50\text{ mA}$   | $TC_\lambda$                 | + 0.3                              | nm/K            |

**Strahlstärke  $I_e$  in Achsrichtung<sup>1)</sup>**  
 gemessen bei einem Raumwinkel  $\Omega = 0.01$  sr  
**Radiant Intensity  $I_e$  in Axial Direction**  
 at a solid angle of  $\Omega = 0.01$  sr

| Bezeichnung<br>Parameter     | Symbol              | Werte<br>Values |            |            | Einheit<br>Unit |
|------------------------------|---------------------|-----------------|------------|------------|-----------------|
|                              |                     | SFH 4253-P      | SFH 4253-Q | SFH 4253-R |                 |
| Strahlstärke                 | $I_{e \text{ min}}$ | 4               | 6.3        | 10         | mW/sr           |
| Radiant intensity            | $I_{e \text{ max}}$ | 8               | 12.5       | 20         | mW/sr           |
| $I_F = 70$ mA, $t_p = 20$ ms |                     |                 |            |            |                 |

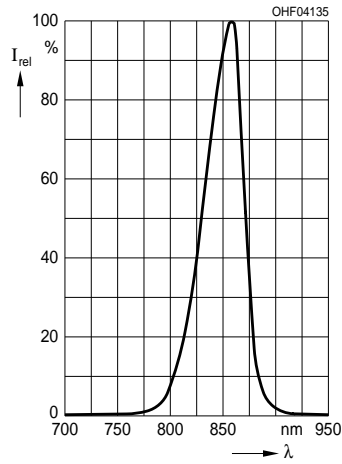
<sup>1)</sup> Nur eine Gruppe in einer Verpackungseinheit (Streuung kleiner 2:1) /  
 Only one group in one packing unit (variation lower 2:1)

**Abstrahlcharakteristik**  
**Radiation Characteristics  $I_{rel} = f(\varphi)$**

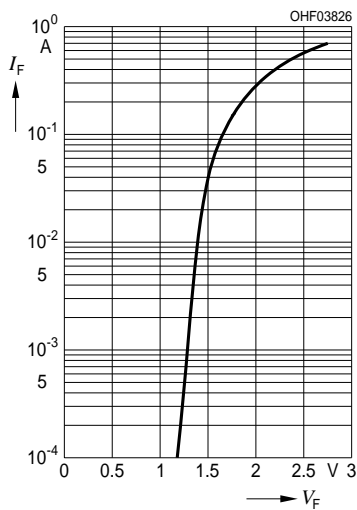


**Relative Spectral Emission**

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

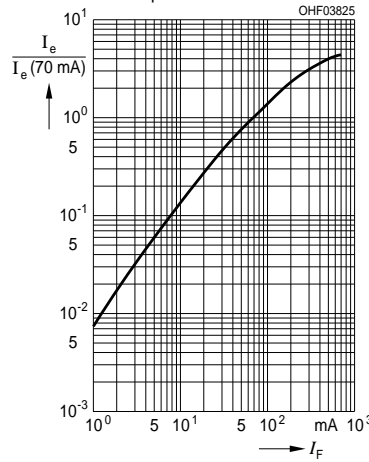


**Forward Current  $I_F = f(V_F)$**   
Single pulse,  $t_p = 25 \mu s$



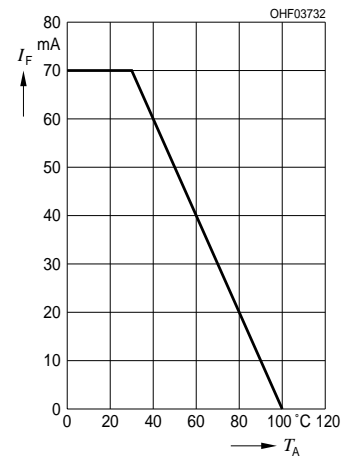
**Radiant Intensity**  $\frac{I_e}{70 \text{ mA}} = f(I_F)$

Single pulse,  $t_p = 25 \mu s$

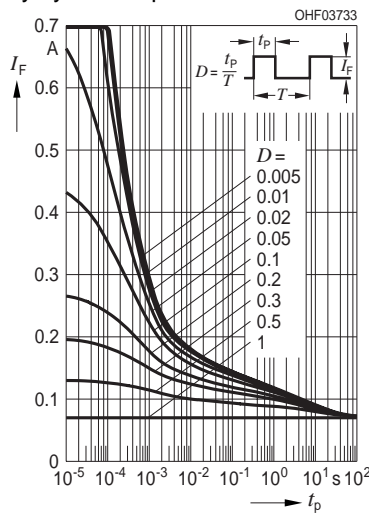


**Max. Permissible Forward Current**

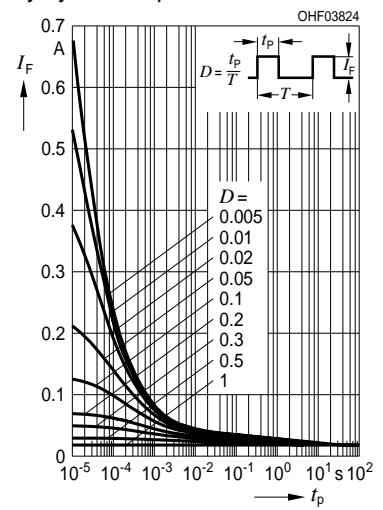
$I_F = f(T_A), R_{thJA} = 500 \text{ K/W}$



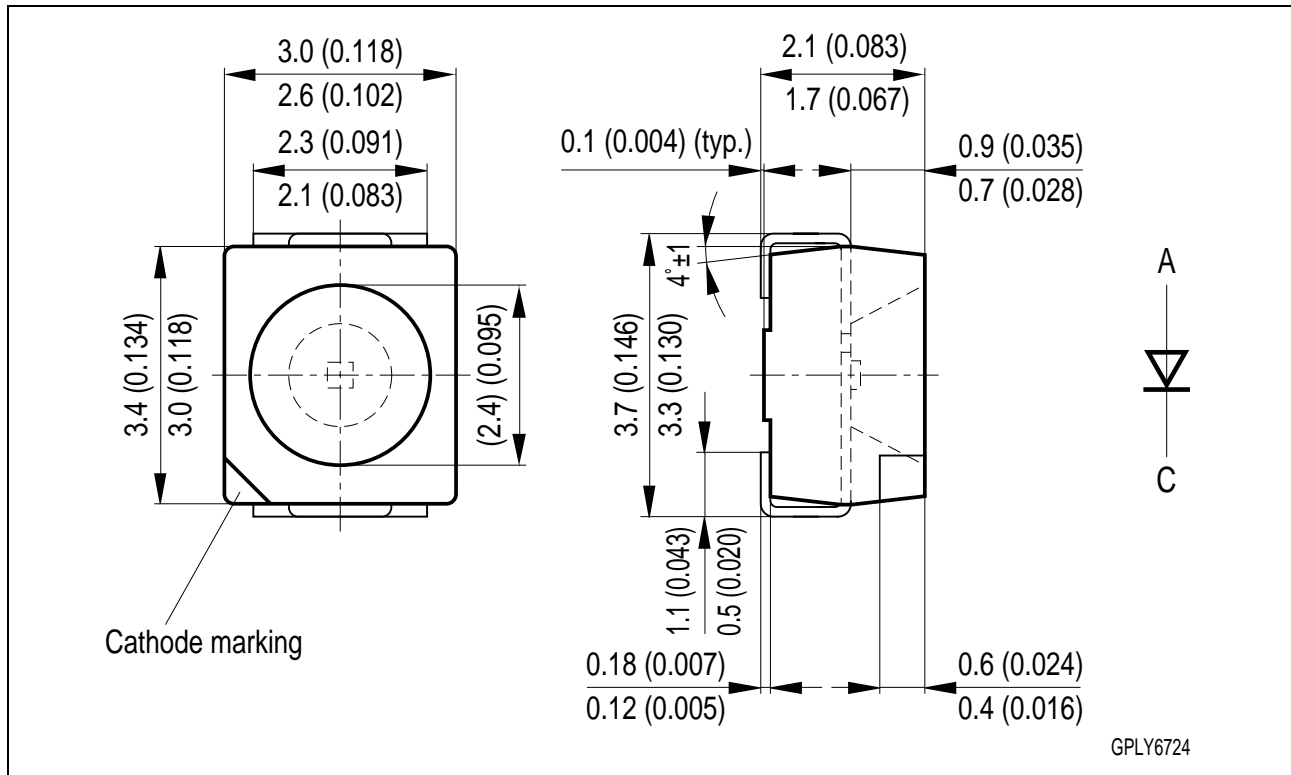
**Permissible Pulse Handling Capability  $I_F = f(\tau), T_A = 25 \text{ }^\circ\text{C}$**   
duty cycle  $D = \text{parameter}$



**Permissible Pulse Handling Capability  $I_F = f(\tau), T_A = 85 \text{ }^\circ\text{C}$**   
duty cycle  $D = \text{parameter}$



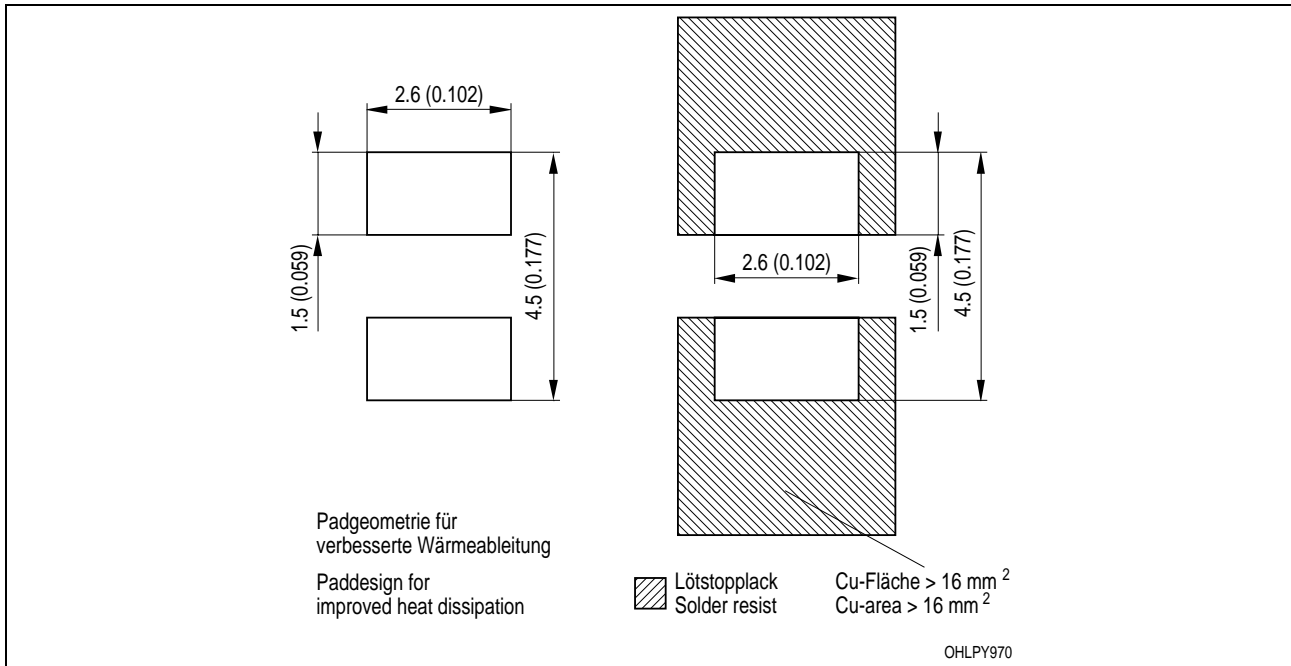
**Maßzeichnung**  
**Package Outlines**



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

|  |  |
|--|--|
| Gehäuse / Package                      | TOPLED <sup>®</sup> , klarer Verguss / TOPLED <sup>®</sup> , clear resin |
| Anschlussbelegung<br>Pin configuration | siehe Zeichnung<br>see drawing   |

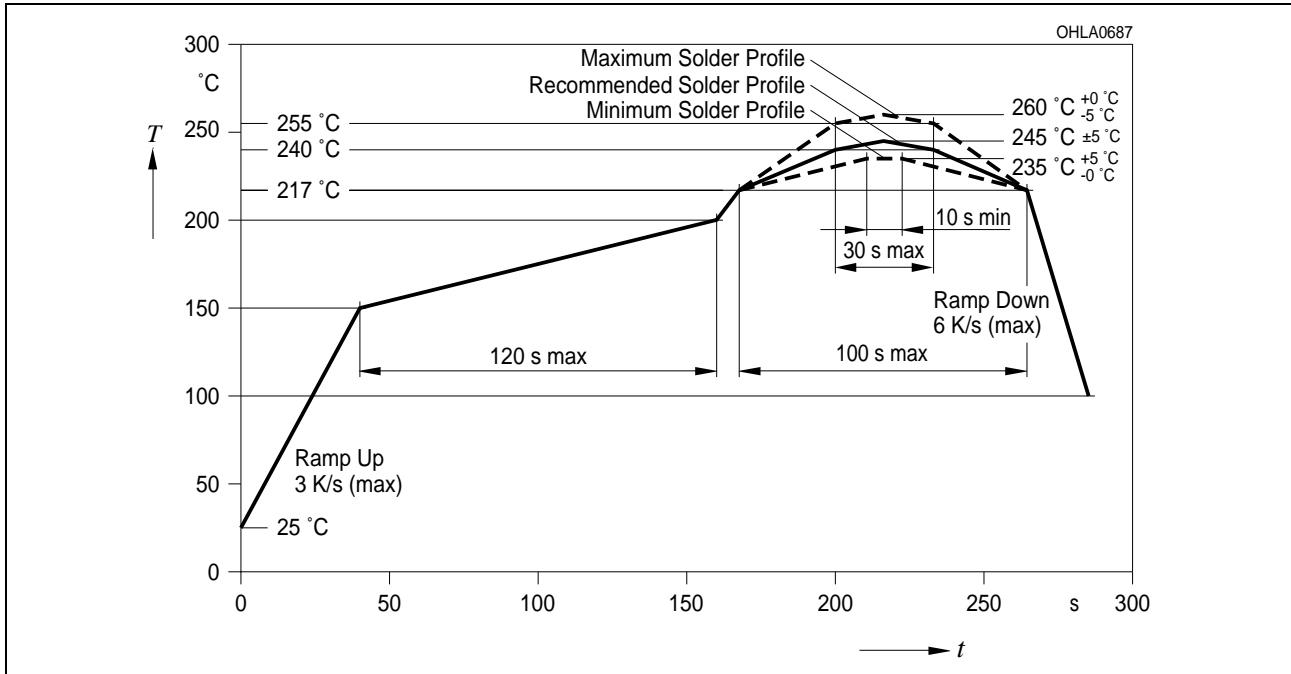
**Empfohlenes Lötpad Design**  
**Recommended Solder Pad Design**



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

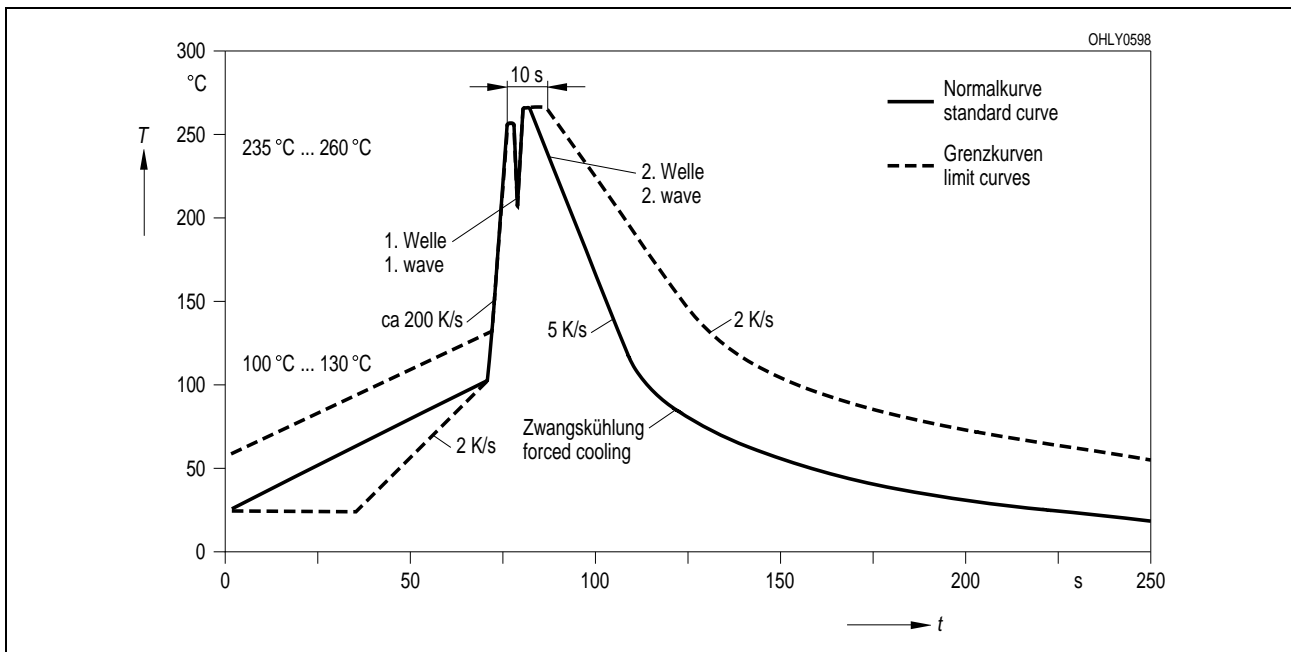
**Lötbedingungen**  
**Soldering Conditions**  
**Reflow Lötprofil für bleifreies Löt**  
**Reflow Soldering Profile for lead free soldering**

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



**Wellenlötten (TTW)**  
**TTW Soldering**

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





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