

**IR-Lumineszenzdiode (940 nm) mit hoher Ausgangsleistung**  
**High Power Infrared Emitter (940 nm)**  
**Lead (Pb) Free Product - RoHS Compliant**  
**SFH 4244**



#### Wesentliche Merkmale

- Infrarot LED mit hoher Ausgangsleistung
- Emissionswellenlänge typ. 940 nm

#### Anwendungen

- Infrarotbeleuchtung für CMOS 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
- Peak wavelength typ. 940 nm

#### Applications

- Infrared Illumination for CMOS 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.

| Typ<br>Type | Bestellnummer<br>Ordering Code | Strahlstärkegruppierung <sup>1)</sup> ( $I_F = 70 \text{ mA}$ , $t_p = 20 \text{ ms}$ )<br>Radiant Intensity Grouping <sup>1)</sup><br>$I_e \text{ (mW/sr)}$ |
|-------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SFH 4244    | Q65110A7516                    | $\geq 4 \text{ (typ. 11)}$                                                                                                                                   |

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



**ATTENTION - Observe Precautions For Handling - Electrostatic Sensitive Device**

**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, $t_p = 100\text{ }\mu\text{s}$ , $D = 0$<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 mm <sup>2</sup><br>Thermal resistance junction - ambient mounted<br>on PC-board (FR4), padsize 16 mm <sup>2</sup> 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>$I_F = 50\text{ mA}$                             | $\lambda_{peak}$             | 940              | 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             | mm <sup>2</sup> |
| 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> |

Kennwerte ( $T_A = 25\text{ °C}$ )

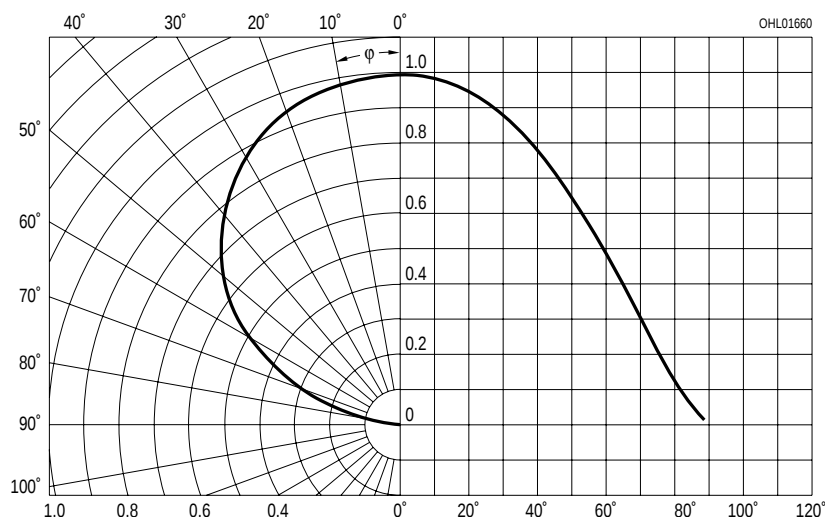
Characteristics (cont'd)

| Bezeichnung<br>Parameter                                                                                                                                                                                                    | Symbol<br>Symbol      | Wert<br>Value                      | Einheit<br>Unit |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|-----------------|
| Schaltzeiten, $I_e$ von 10% auf 90% und von 90% auf 10%, bei $I_F = 50\text{ mA}$ , $R_L = 50\text{ }\Omega$<br>Switching times, $I_e$ from 10% to 90% and from 90% to 10%, $I_F = 50\text{ mA}$ , $R_L = 50\text{ }\Omega$ | $t_r$ , $t_f$         | 11                                 | ns              |
| Durchlassspannung<br>Forward voltage<br>$I_F = 50\text{ mA}$ , $t_p = 20\text{ ms}$<br>$I_F = 500\text{ mA}$ , $t_p = 100\text{ }\mu\text{s}$                                                                               | $V_F$<br>$V_F$        | 1.5 (< 1.9)<br>2.4 (< 3.0)         | V<br>V          |
| Sperrstrom<br>Reverse current<br>$V_R = 5\text{ V}$                                                                                                                                                                         | $I_R$                 | 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. $\Phi_e$ , $I_F = 50\text{ mA}$<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 $V_F$ , $I_F = 50\text{ mA}$                                                                                                           | $TC_V$                | – 3.5                              | 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

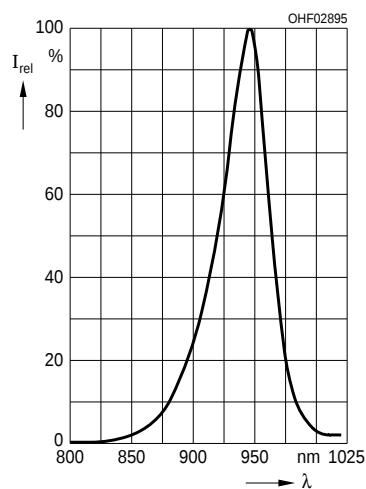
| Bezeichnung<br>Parameter     | Symbol              | Werte<br>Values |            |            | Einheit<br>Unit |
|------------------------------|---------------------|-----------------|------------|------------|-----------------|
|                              |                     | SFH 4244-P      | SFH 4244-Q | SFH 4244-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)

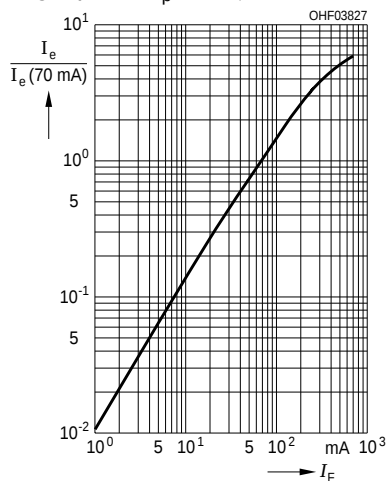
**Abstrahlcharakteristik****Radiation Characteristics  $I_{\text{rel}} = f(\varphi)$** 

**Relative Spectral Emission**

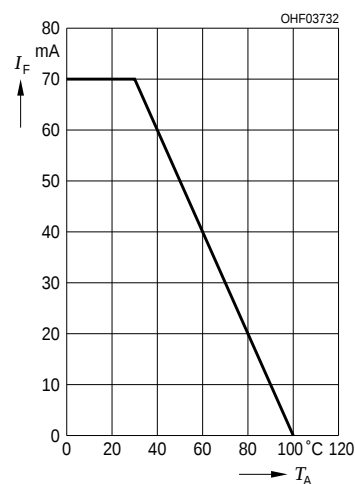
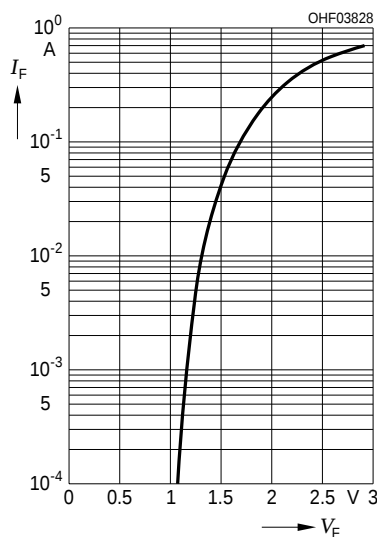
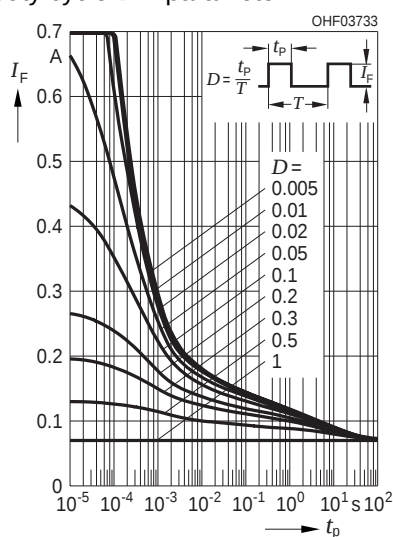
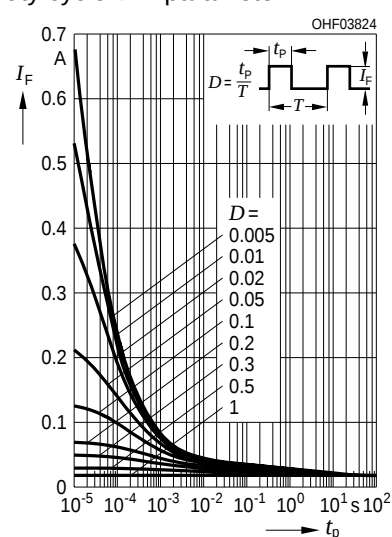
$$I_{\text{rel}} = f(\lambda)$$



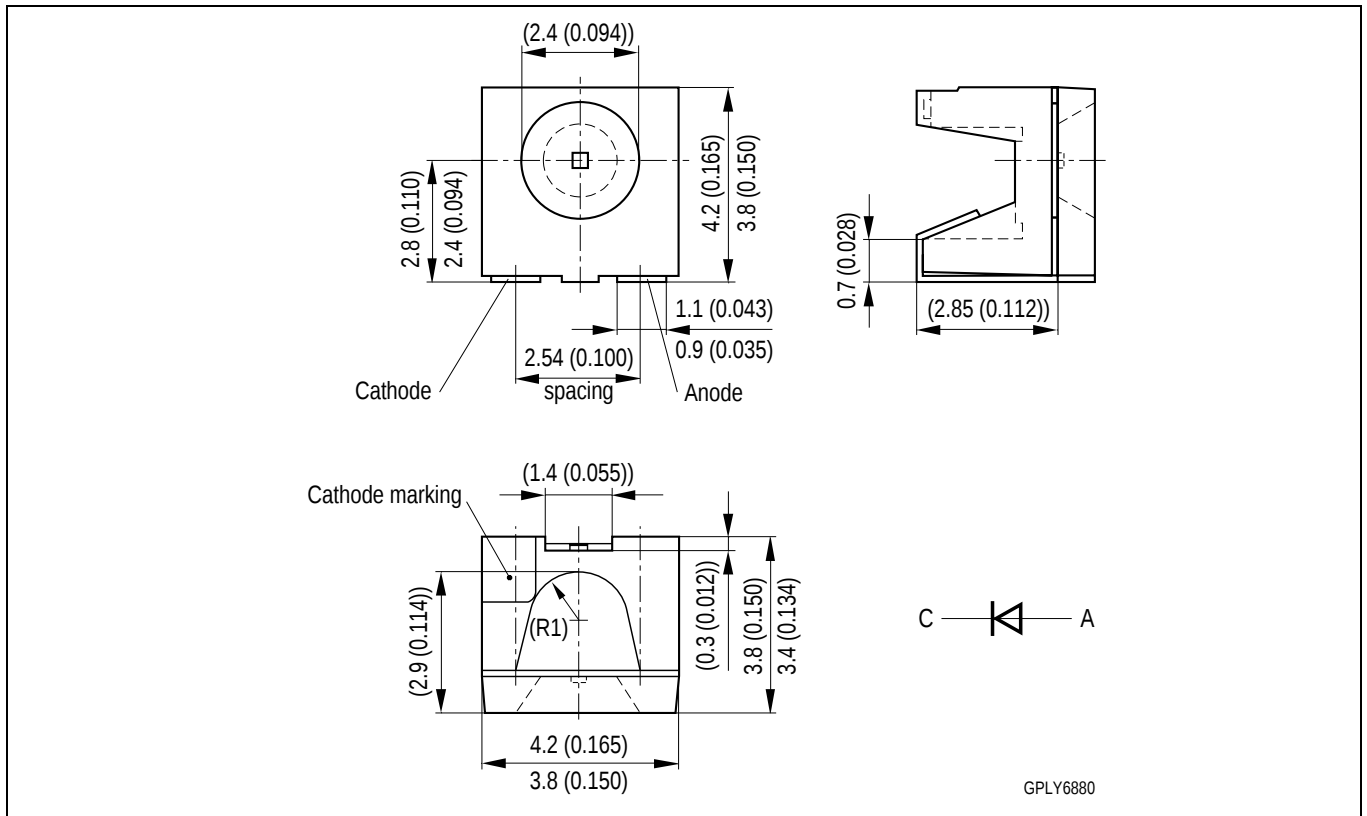
$$\text{Radiant Intensity } \frac{I_e}{I_{e, 70 \text{ mA}}} = f(I_F)$$

Single pulse,  $t_p = 25 \mu\text{s}$ **Max. Permissible Forward Current**

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

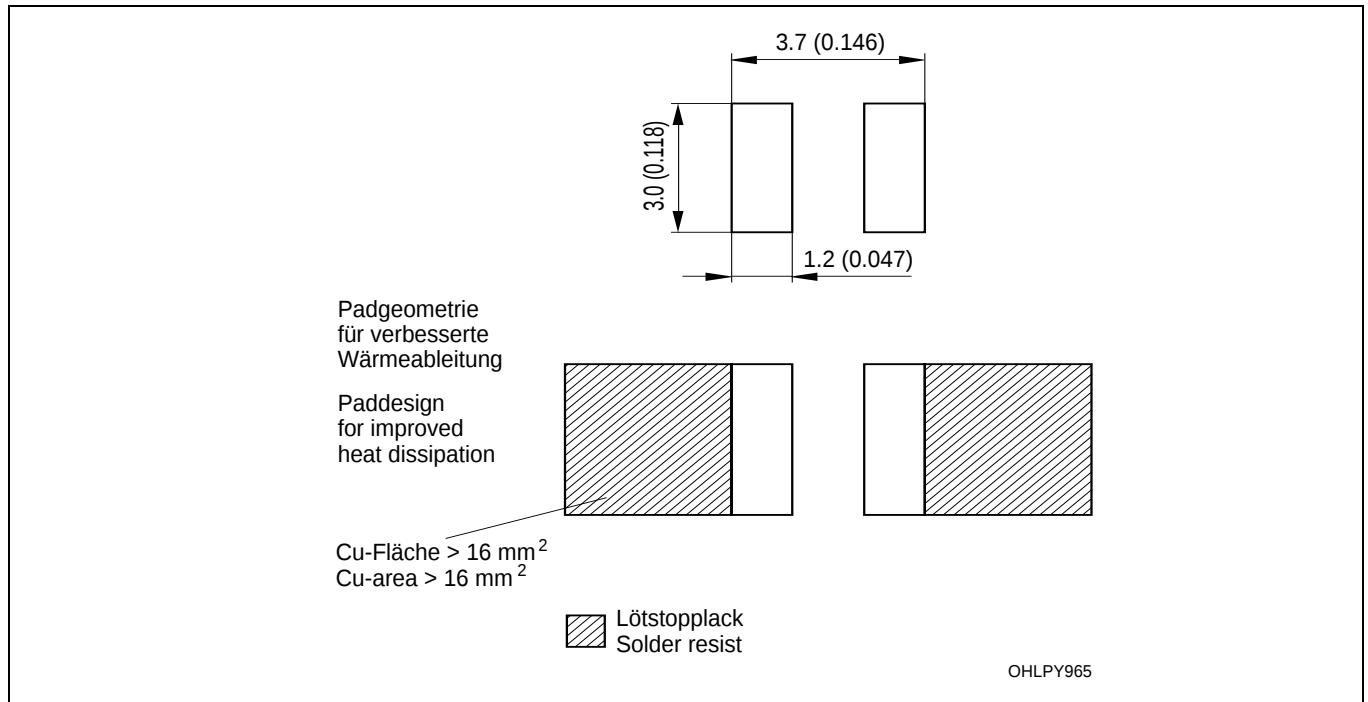
**Forward Current  $I_F = f(V_F)$** Single pulse,  $t_p = 25 \mu\text{s}$ **Permissible Pulse Handling Capability**
 $I_F = f(\tau), T_A = 25^\circ\text{C}$ ,  
duty cycle  $D = \text{parameter}$ 
**Permissible Pulse Handling Capability**
 $I_F = f(\tau), T_A = 85^\circ\text{C}$ ,  
duty cycle  $D = \text{parameter}$ 


# Maßzeichnung Package Outlines



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

|                                        |                                                                            |
|----------------------------------------|----------------------------------------------------------------------------|
| Gehäuse / Package                      | SIDELED <sup>®</sup> , klarer Verguss / SIDELED <sup>®</sup> , clear resin |
| Anschlussbelegung<br>Pin configuration | Kathode: abgeschrägte Ecke<br>Cathode: beveled edge                        |

**Empfohlenes Lötpad-Design**  
**Recommended Solder Pad Design**Reflow Löten  
Reflow Soldering

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

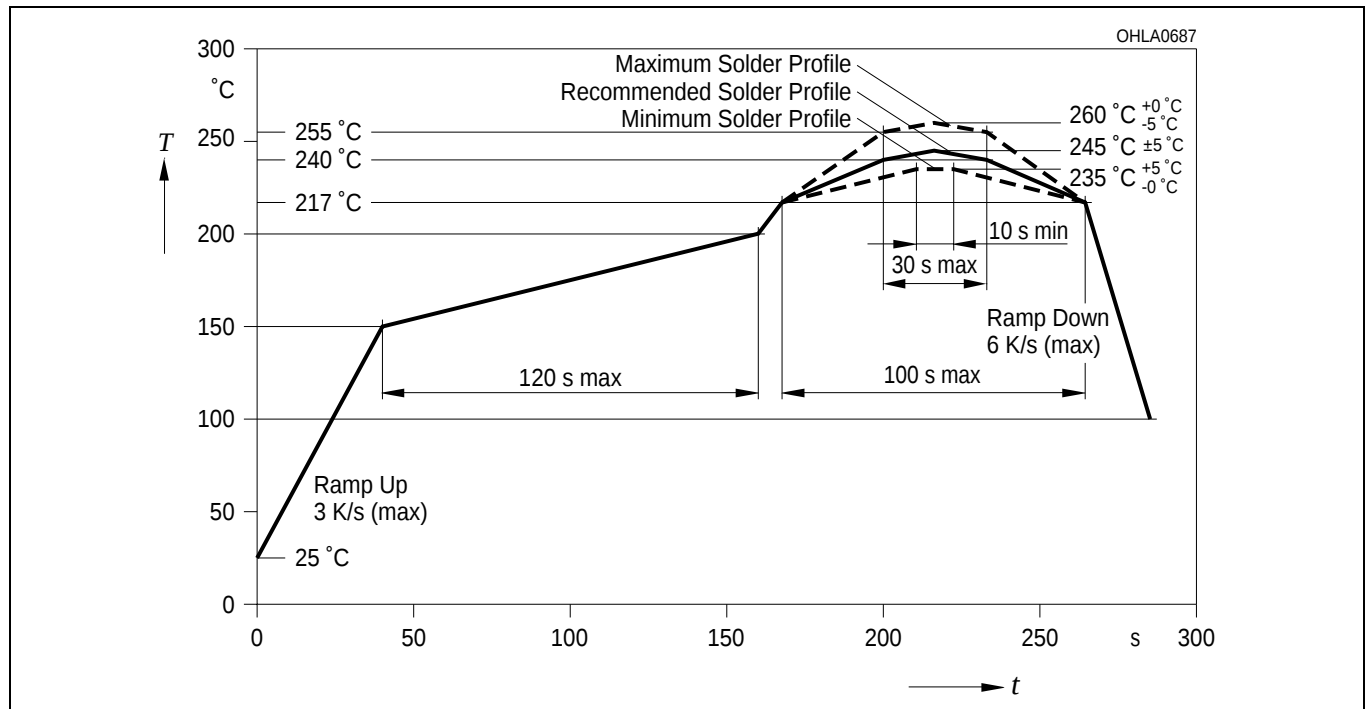
**Lötbedingungen****Soldering Conditions****Reflow Lötprofil für bleifreies Löten****Reflow Soldering Profile for lead free soldering**

Vorbehandlung nach JEDEC Level 2

Preconditioning acc. to JEDEC Level 2

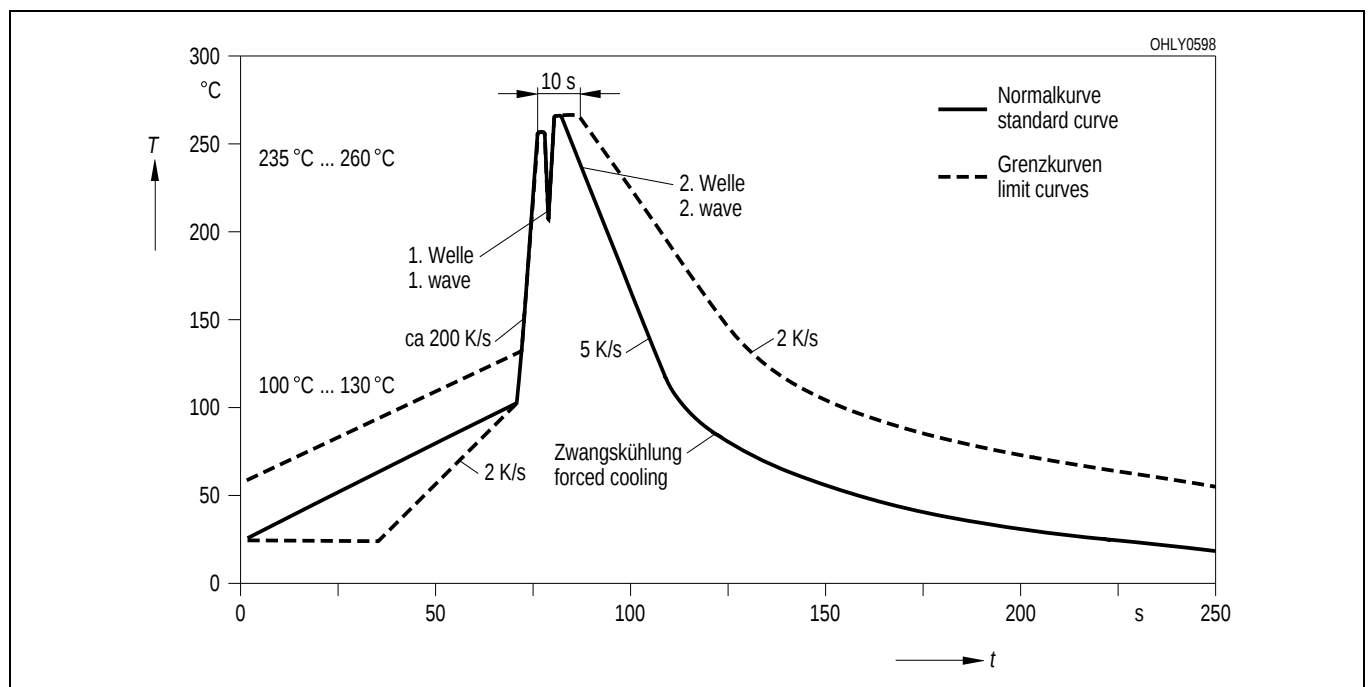
(nach J-STD-020C)

(acc. to J-STD-020C)

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

(nach CECC 00802)

(acc. to CECC 00802)



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The information describes the type of component and shall not be considered as assured characteristics. Terms of delivery and rights to change design reserved. Due to technical requirements components may contain dangerous substances. For information on the types in question please contact our Sales Organization.

#### Packing

Please use the recycling operators known to you. We can also help you – get in touch with your nearest sales office. By agreement we will take packing material back, if it is sorted. You must bear the costs of transport. For packing material that is returned to us unsorted or which we are not obliged to accept, we shall have to invoice you for any costs incurred.

**Components used in life-support devices or systems must be expressly authorized for such purpose!** Critical components <sup>1</sup>, may only be used in life-support devices or systems <sup>2</sup> with the express written approval of OSRAM OS.

<sup>1</sup> A critical component is a component used in a life-support device or system whose failure can reasonably be expected to cause the failure of that life-support device or system, or to affect its safety or effectiveness of that device or system.

<sup>2</sup> Life support devices or systems are intended (a) to be implanted in the human body, or (b) to support and/or maintain and sustain human life. If they fail, it is reasonable to assume that the health of the user may be endangered.