

IR-Lumineszenzdiode (850 nm) mit hoher Ausgangsleistung
High Power Infrared Emitter (850 nm)
Lead (Pb) Free Product - RoHS Compliant
SFH 4250



Vorläufige Daten / Preliminary Data

Wesentliche Merkmale

- Infrarot LED mit sehr hoher Ausgangsleistung
- Emissionswellenlänge typ. 850 nm
- Hohe Bestromung bei hohen Temperaturen möglich

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. 850 nm
- High forward current allowed at high temperature

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 Type | Bestellnummer Ordering Code | Strahlstärkegruppierung ¹⁾ ($I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$) Radiant Intensity Grouping ¹⁾ $I_e \text{ (mW/sr)}$ |
|-------------|--------------------------------|---|
| SFH 4250 | Q65110A2465 | ≥ 10 (typ. 15) |

¹⁾ 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 Parameter | Symbol Symbol | Wert Value | Einheit Unit |
|---|-------------------|----------------|-----------------|
| Betriebs- und Lagertemperatur Operating and storage temperature range | T_{op}, T_{stg} | - 40 ... + 100 | °C |
| Sperrspannung Reverse voltage | V_R | 5 | V |
| Vorwärtsgleichstrom Forward current | I_F | 100 | mA |
| Stoßstrom, $t_p = 100\ \mu\text{s}$, $D = 0$ Surge current | I_{FSM} | 1.5 | A |
| Verlustleistung Power dissipation | P_{tot} | 180 | mW |
| Wärmewiderstand Sperrschicht - Umgebung bei Montage auf FR4 Platine, Padgröße je $16\ \text{mm}^2$ Thermal resistance junction - ambient mounted on PC-board (FR4), pads size $16\ \text{mm}^2$ each | R_{thJA} | 300 | K/W |
| Wärmewiderstand Sperrschicht - Lötstelle bei Montage auf Metall-Block Thermal resistance junction - soldering point, mounted on metal block | R_{thJS} | 140 | K/W |

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

| Bezeichnung Parameter | Symbol Symbol | Wert Value | Einheit Unit |
|--|------------------------------|------------------|-----------------|
| Wellenlänge der Strahlung Wavelength at peak emission $I_F = 100\ \text{mA}$ | λ_{peak} | 850 | nm |
| Spektrale Bandbreite bei 50% von I_{max} Spectral bandwidth at 50% of I_{max} $I_F = 100\ \text{mA}$ | $\Delta\lambda$ | 35 | nm |
| Abstrahlwinkel Half angle | φ | ± 60 | Grad deg. |
| Aktive Chipfläche Active chip area | A | 0.09 | mm^2 |
| Abmessungen der aktiven Chipfläche Dimension of the active chip area | $L \times B$ $L \times W$ | 0.3×0.3 | mm^2 |

Kennwerte ($T_A = 25\text{ °C}$)

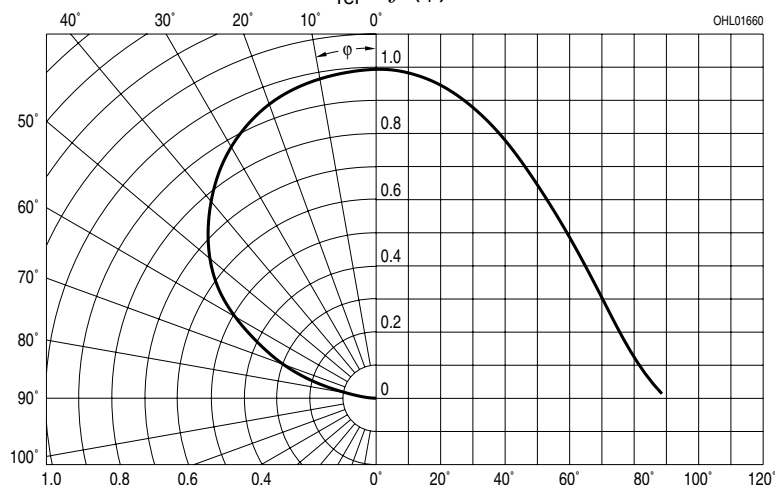
Characteristics (cont'd)

| Bezeichnung Parameter | Symbol Symbol | Wert Value | Einheit Unit |
|---|-----------------------|------------------------------------|-----------------|
| Schaltzeiten, I_e von 10% auf 90% und von 90% auf 10%, bei $I_F = 100\text{ mA}$, $R_L = 50\ \Omega$ Switching times, I_e from 10% to 90% and from 90% to 10%, $I_F = 100\text{ mA}$, $R_L = 50\ \Omega$ | t_r, t_f | 12 | ns |
| Durchlassspannung Forward voltage $I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$ $I_F = 1\text{ A}$, $t_p = 100\ \mu\text{s}$ | V_F V_F | 1.5 (< 1.8) 2.4 (< 3.0) | V V |
| Sperrstrom Reverse current $V_R = 5\text{ V}$ | I_R | not designed for reverse operation | μA |
| Gesamtstrahlungsfluss Total radiant flux $I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$ | $\Phi_{e\text{ typ}}$ | 40 | mW |
| Temperaturkoeffizient von I_e bzw. Φ_e , $I_F = 100\text{ mA}$ Temperature coefficient of I_e or Φ_e , $I_F = 100\text{ mA}$ | TC_I | - 0.5 | %/K |
| Temperaturkoeffizient von V_F , $I_F = 100\text{ mA}$ Temperature coefficient of V_F , $I_F = 100\text{ mA}$ | TC_V | - 0.7 | mV/K |
| Temperaturkoeffizient von λ , $I_F = 100\text{ mA}$ Temperature coefficient of λ , $I_F = 100\text{ mA}$ | TC_λ | + 0.2 | nm/K |

Strahlstärke I_e in Achsrichtung¹⁾gemessen bei einem Raumwinkel $\Omega = 0.01$ sr**Radiant Intensity I_e in Axial Direction**at a solid angle of $\Omega = 0.01$ sr

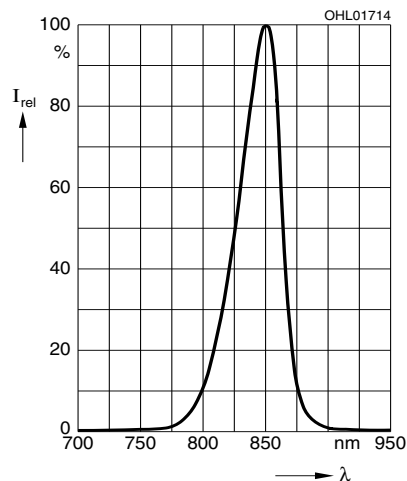
| Bezeichnung Parameter | Symbol | Werte Values | | Einheit Unit |
|---|--|-----------------|------------|-----------------|
| | | SFH 4250-R | SFH 4250-S | |
| Strahlstärke Radiant intensity $I_F = 100$ mA, $t_p = 20$ ms | $I_{e \text{ min}}$ $I_{e \text{ max}}$ | 10 20 | 16 32 | mW/sr mW/sr |
| Strahlstärke Radiant intensity $I_F = 1$ A, $t_p = 100$ μ s | $I_{e \text{ typ}}$ | 100 | 140 | mW/sr |

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

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

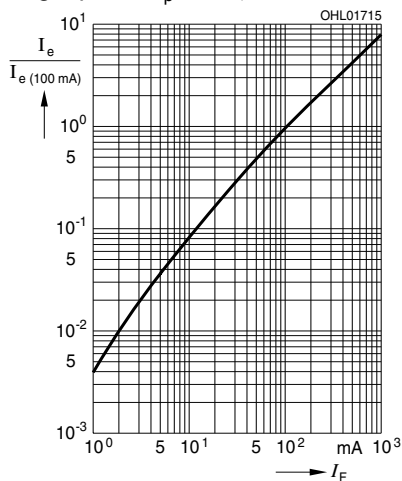
Relative Spectral Emission

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



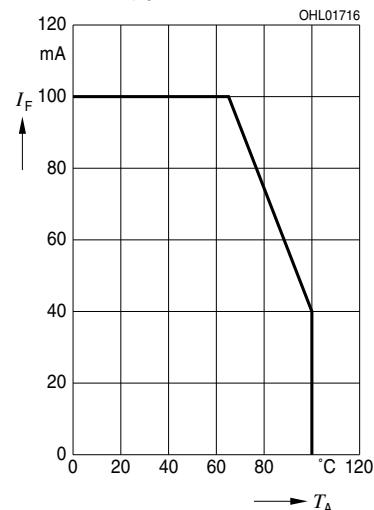
Radiant Intensity $\frac{I_e}{I_e 100 \text{ mA}} = f(I_F)$

Single pulse, $t_p = 20 \mu\text{s}$



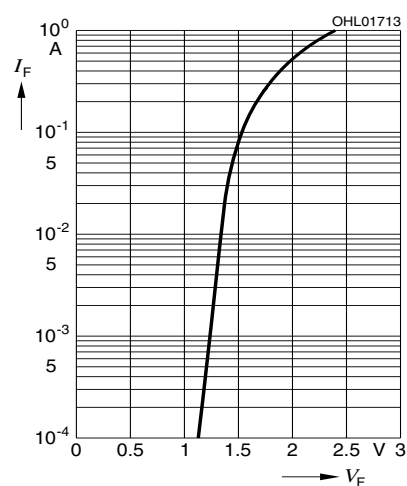
Max. Permissible Forward Current

$I_F = f(T_A), R_{thJA} = 300 \text{ K/W}$



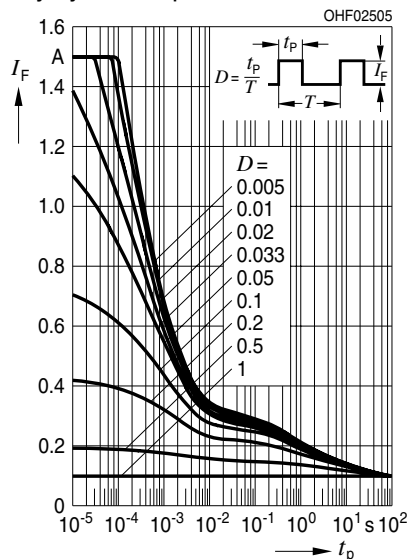
Forward Current $I_F = f(V_F)$

Single pulse, $t_p = 20 \mu\text{s}$

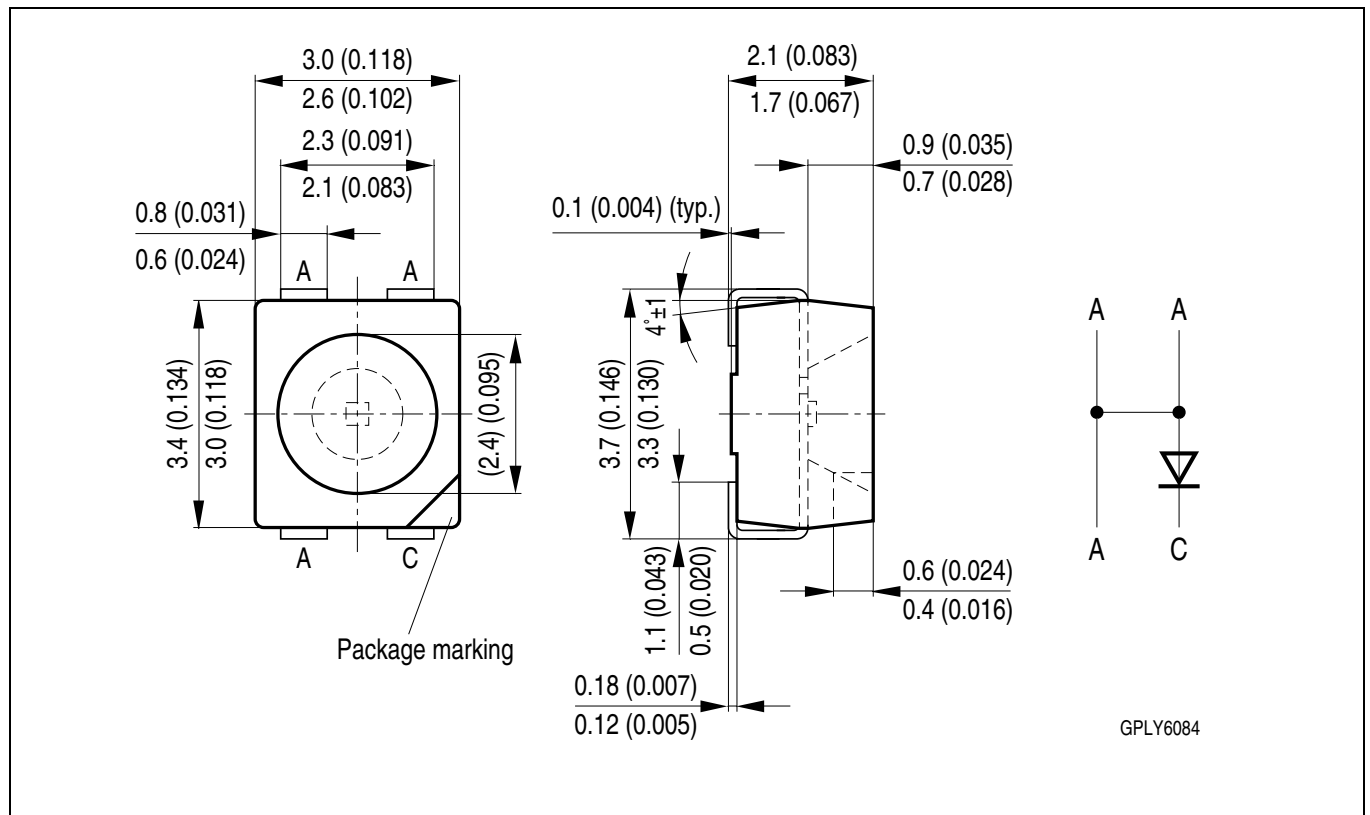


Permissible Pulse Handling Capability

$I_F = f(\tau), T_A \leq 65 \text{ }^\circ\text{C}$,
duty cycle $D = \text{parameter}$



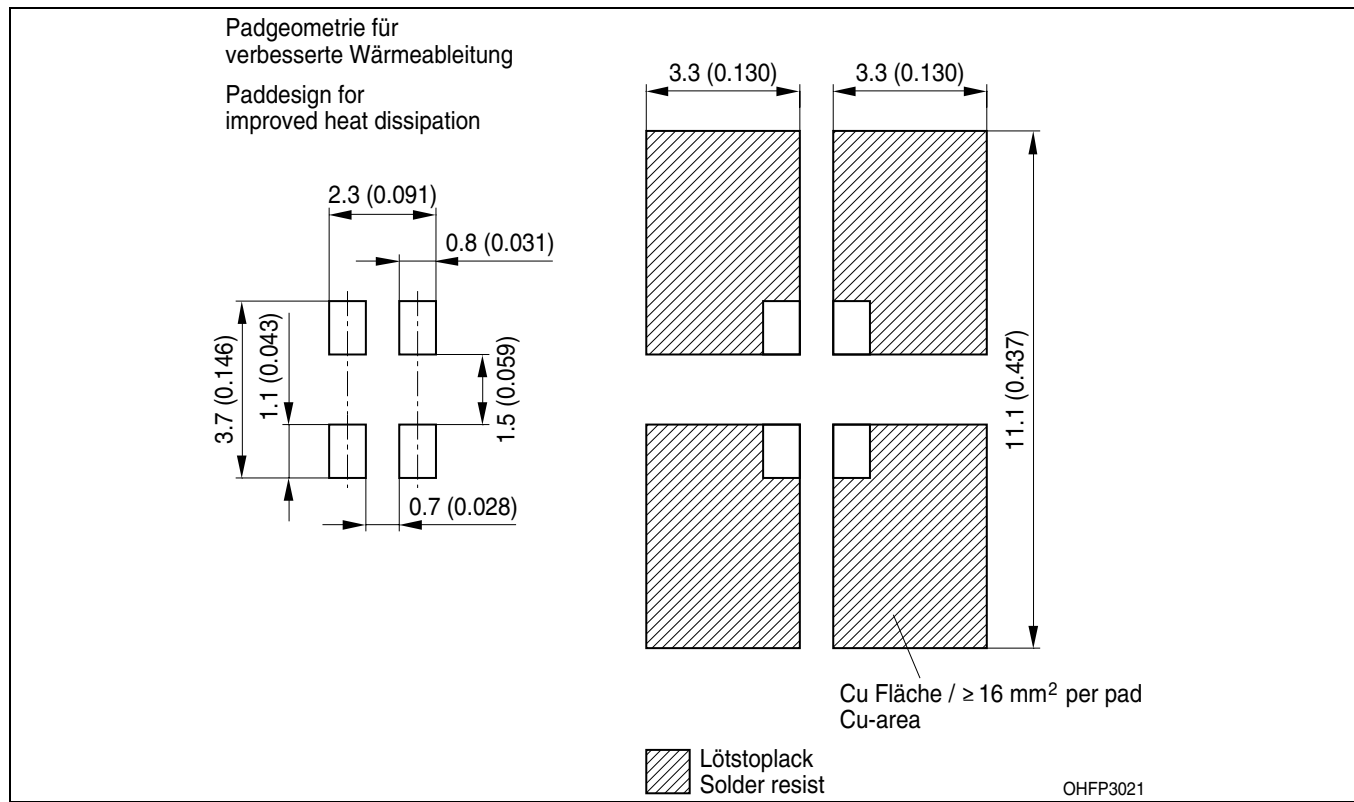
Maßzeichnung Package Outlines



| | |
|--|---|
| Gehäuse / Package | weiß, klarer Verguss / white, clear resin |
| Anschlussbelegung Pin configuration | Kathode: abgeschrägte Ecke Cathode: beveled edge |

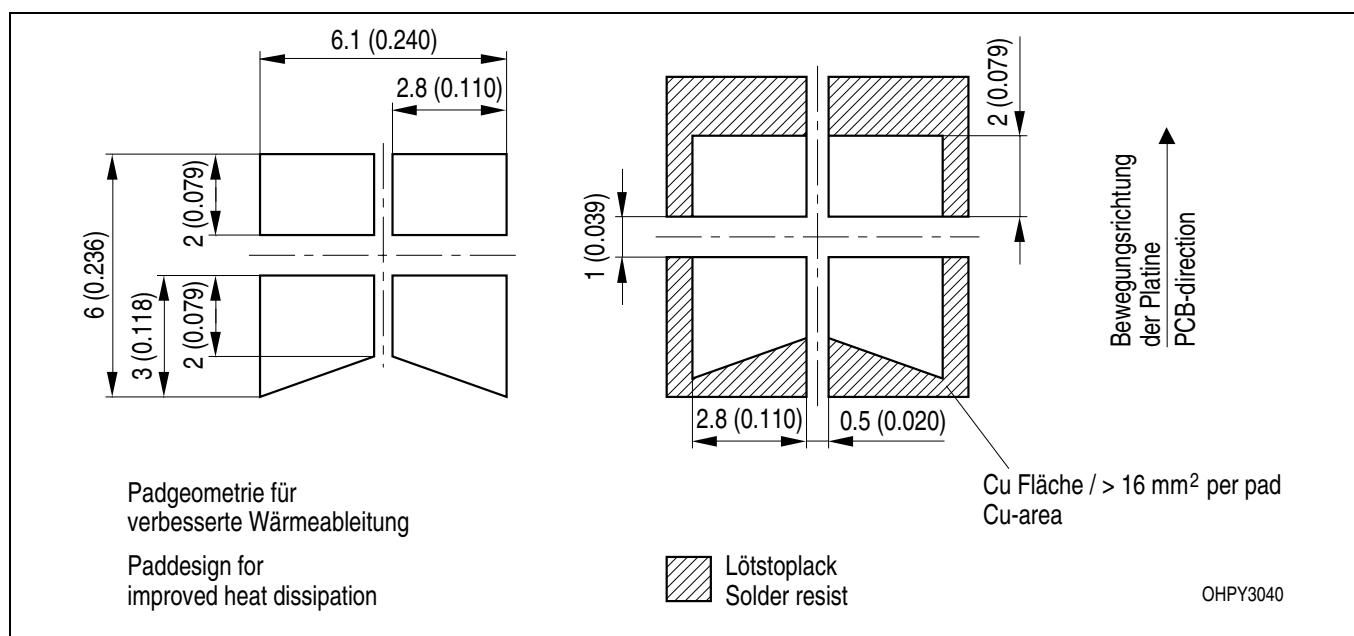
Empfohlenes Lötpaddesign
Recommended Solder Pad Design

Reflow Löten
Reflow Soldering



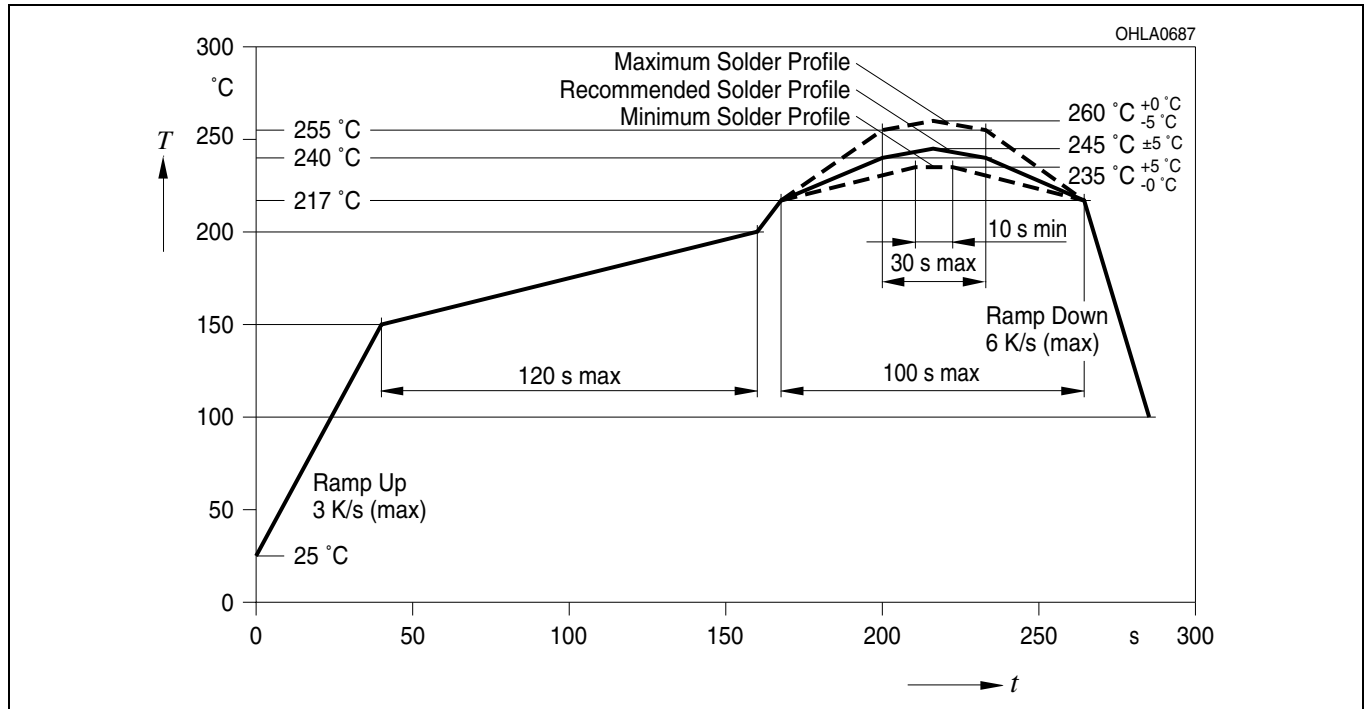
Empfohlenes Lötpaddesign
Recommended Solder Pad Design

Wellenlöten TTW
TTW Soldering



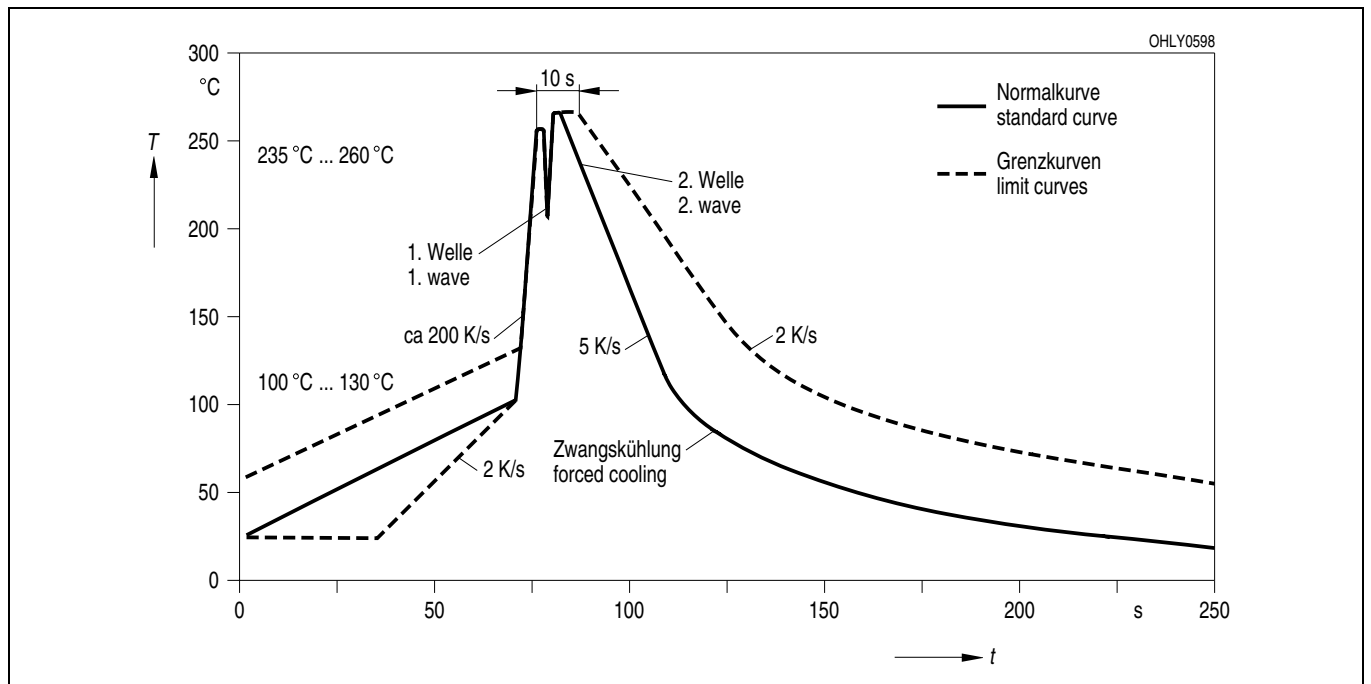
Lötbedingungen
Soldering Conditions
Reflow Lötprofil für bleifreies Löten
Reflow Soldering Profile for lead free soldering

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)



Published by
OSRAM Opto Semiconductors GmbH
Wernerwerkstrasse 2, D-93049 Regensburg
www.osram-os.com
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