

**IR-Lumineszenzdiode (940 nm) mit hoher Ausgangsleistung**  
**High Power Infrared Emitter (940 nm)**  
**Lead (Pb) Free Product - RoHS Compliant**  
**SFH 4231**



**Wesentliche Merkmale**

- IR-Lichtquelle mit hohem Wirkungsgrad
- Chipgröße (emittierende Fläche) 1 x 1 mm<sup>2</sup>
- max. Gleichstrom 1 A
- niedriger Wärmewiderstand (15 K/W)
- Schwerpunktwellenlänge 940 nm
- ESD-sicher bis 2 kV nach JESD22-A114-E

**Anwendungen**

- Infrarotbeleuchtung für Kameras
- Überwachungssysteme
- IR-Datenübertragung
- Fahrer-Assistenz Systeme
- Maschinensicherheit

**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**

- IR lightsource with high efficiency
- die-size (emitting area) 1 x 1 mm<sup>2</sup>
- max. DC-current 1 A
- Low thermal resistance (15 K/W)
- Center of spectral emission at 940 nm
- ESD safe up to 2 kV acc. to JESD22-A114-E

**Applications**

- Infrared Illumination for cameras
- Surveillance systems
- IR Data Transmission
- Driver assistance systems
- Machine security

**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	Gesamtstrahlungsfluss <sup>1)</sup> ( $I_F = 1A, t_p = 100 \mu s$ ) Total Radiant Flux <sup>1)</sup> $\Phi_e$ (mW)
SFH 4231	Q65110A4808	≥ 320 (typ. 500)

<sup>1)</sup> gemessen mit Ulbrichtkugel / measured with integrating sphere

**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
Sperrschichttemperatur Junction temperature	$T_J$	+ 125	°C
Sperrspannung Reverse voltage	$V_R$	1	V
Vorwärtsgleichstrom Forward current	$I_F$	1	A
Stoßstrom, $t_p < 1\text{ ms}$ , $D = 0.2$ Surge current	$I_{FSM}$	2	A
Leistungsaufnahme Power consumption	$P_{tot}$	2.4	W
Wärmewiderstand Sperrschicht - Lötstelle bei Montage auf Metall-Block Thermal resistance junction - soldering point, mounted on metal block	$R_{thJS}$	15	K/W

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

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Wellenlänge der Strahlung Wavelength at peak emission $I_F = 1\text{ A}$ , $t_p = 10\text{ ms}$	$\lambda_{peak}$	950	nm
Centroid-Wellenlänge der Strahlung Centroid wavelength $I_F = 1\text{ A}$ , $t_p = 10\text{ ms}$	$\lambda_{centroid}$	940	nm
Spektrale Bandbreite bei 50% von $I_{max}$ Spectral bandwidth at 50% of $I_{max}$ $I_F = 1\text{ A}$ , $t_p = 10\text{ ms}$	$\Delta\lambda$	45	nm
Abstrahlwinkel Half angle	$\varphi$	$\pm 60$	Grad deg.
Aktive Chipfläche Active chip area	$A$	1	mm <sup>2</sup>
Abmessungen der aktiven Chipfläche Dimension of the active chip area	$L \times B$ $L \times W$	1 × 1	mm <sup>2</sup>

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%, $I_F = 1\text{ A}$ , $R_L = 50\ \Omega$ Switching times, $I_e$ from 10% to 90% and from 90% to 10%, $I_F = 1\text{ A}$ , $R_L = 50\ \Omega$	$t_r, t_f$	20	ns
Durchlassspannung Forward voltage $I_F = 1\text{ A}$ , $t_p = 100\ \mu\text{s}$	$V_F$	1.8 (< 2.4)	V
Strahlstärke Radiant intensity $I_F = 1\text{ A}$ , $t_p = 100\ \mu\text{s}$	$I_{e\text{ typ}}$	170	mW/sr
Temperaturkoeffizient von $I_e$ bzw. $\Phi_e$ Temperature coefficient of $I_e$ or $\Phi_e$ $I_F = 1\text{ A}$ , $t_p = 10\text{ ms}$	$TC_I$	- 0.5	%/K
Temperaturkoeffizient von $V_F$ Temperature coefficient of $V_F$ $I_F = 1\text{ A}$ , $t_p = 10\text{ ms}$	$TC_V$	- 1	mV/K
Temperaturkoeffizient von $\lambda$ Temperature coefficient of $\lambda$ $I_F = 1\text{ A}$ , $t_p = 10\text{ ms}$	$TC_{\lambda, \text{centroid}}$	+ 0.3	nm/K

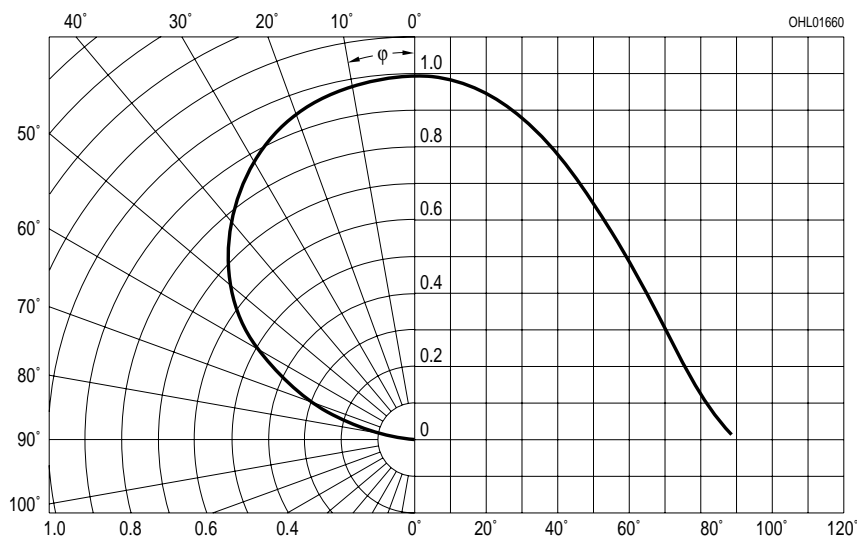
**Gesamtstrahlungsfluss<sup>1)</sup>  $\Phi_e$**   
**Total Radiant Flux<sup>1)</sup>  $\Phi_e$**

Bezeichnung Parameter	Symbol	Werte Values		Einheit Unit
		SFH 4231-CX	SFH 4231-DX	
Gesamtstrahlungsfluss Total Radiant Flux $I_F = 1 \text{ A}, t_p = 100 \mu\text{s}$	$\Phi_{e \text{ min}}$ $\Phi_{e \text{ max}}$	320 630	500 1000	mW mW

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

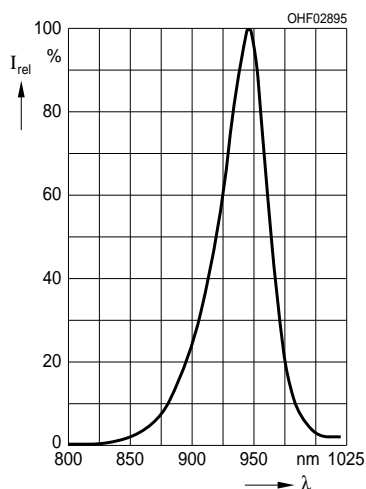
**Abstrahlcharakteristik**

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



**Relative spektrale Emission**  
**Relative Spectral Emission**

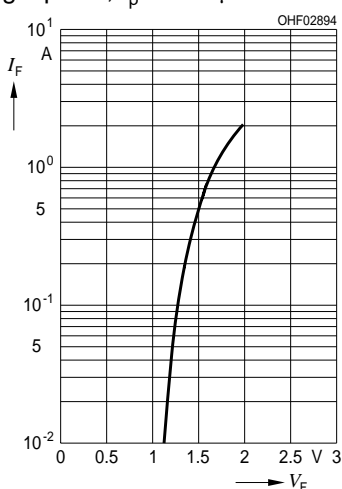
$I_{rel} = f(\lambda)$



**Durchlassstrom**  
**Forward Current**

$I_F = f(V_F)$

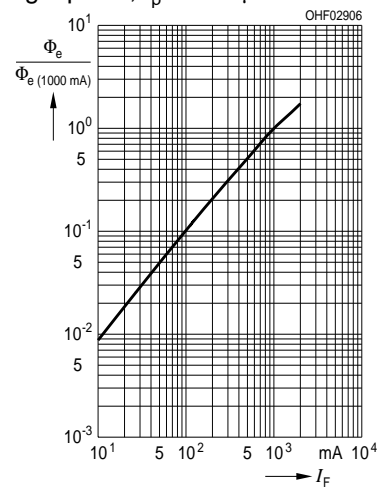
Single pulse,  $t_p = 100 \mu s$



**Relativer Gesamtstrahlungsfluss**  
**Relative Total Radiant Flux**

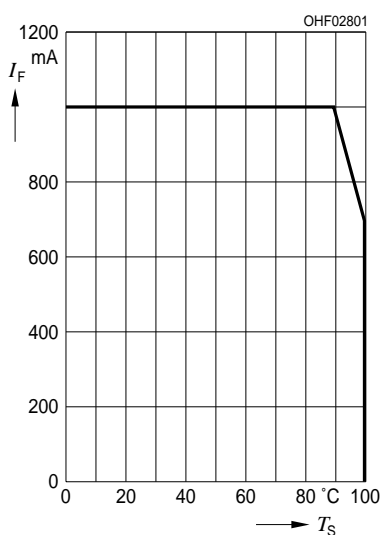
$\Phi_e / \Phi_e(1000mA) = f(I_F)$

Single pulse,  $t_p = 100 \mu s$



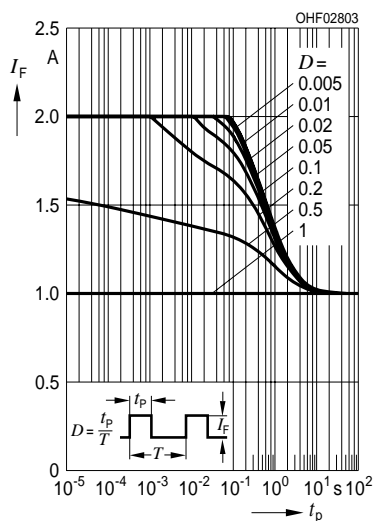
**Max. zulässiger Durchlassstrom**  
**Max. Permissible Forward Current**

$I_F = f(T_A), R_{thJS} = 15 \text{ K/W}$

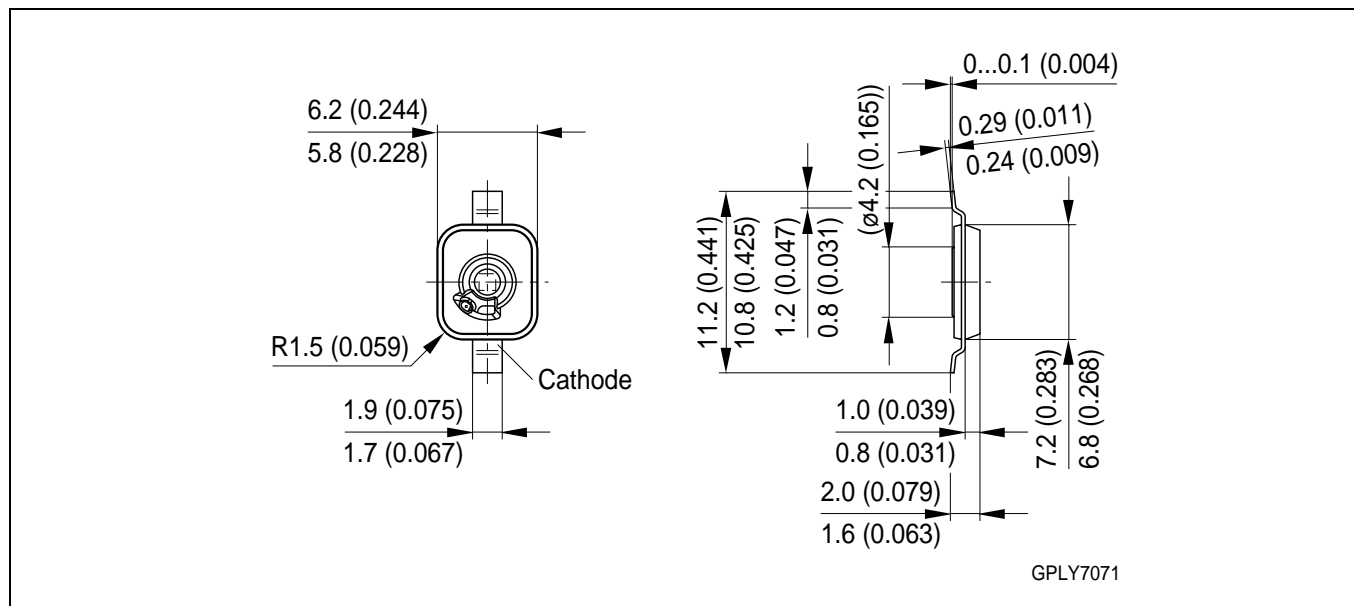


**Zulässige Impulsbelastbarkeit**  
**Permissible Pulse Handling**

**Capability**  $I_F = f(t_p), T_A = 85 \text{ }^\circ\text{C}$ ,  
Duty cycle  $D = \text{parameter}$



Maßzeichnung<sup>1)</sup>  
Package Outlines

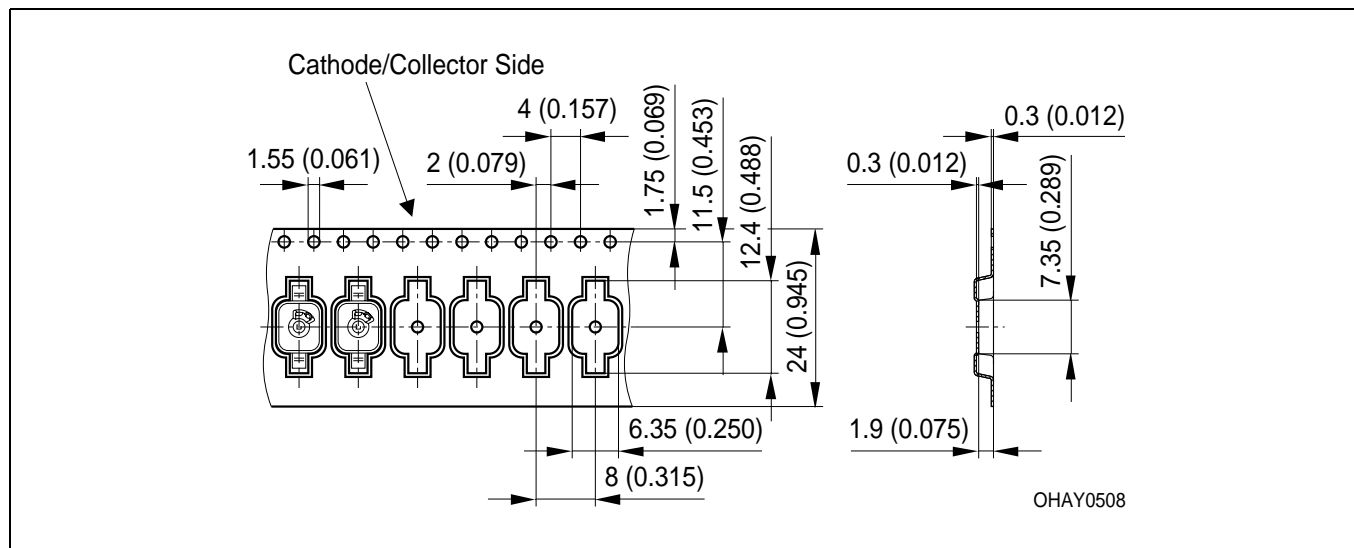


**Kathodenkennung:**  
**Cathode mark:**  
**Gewicht / Approx. weight:**

**Markierung**  
mark  
0.2 g

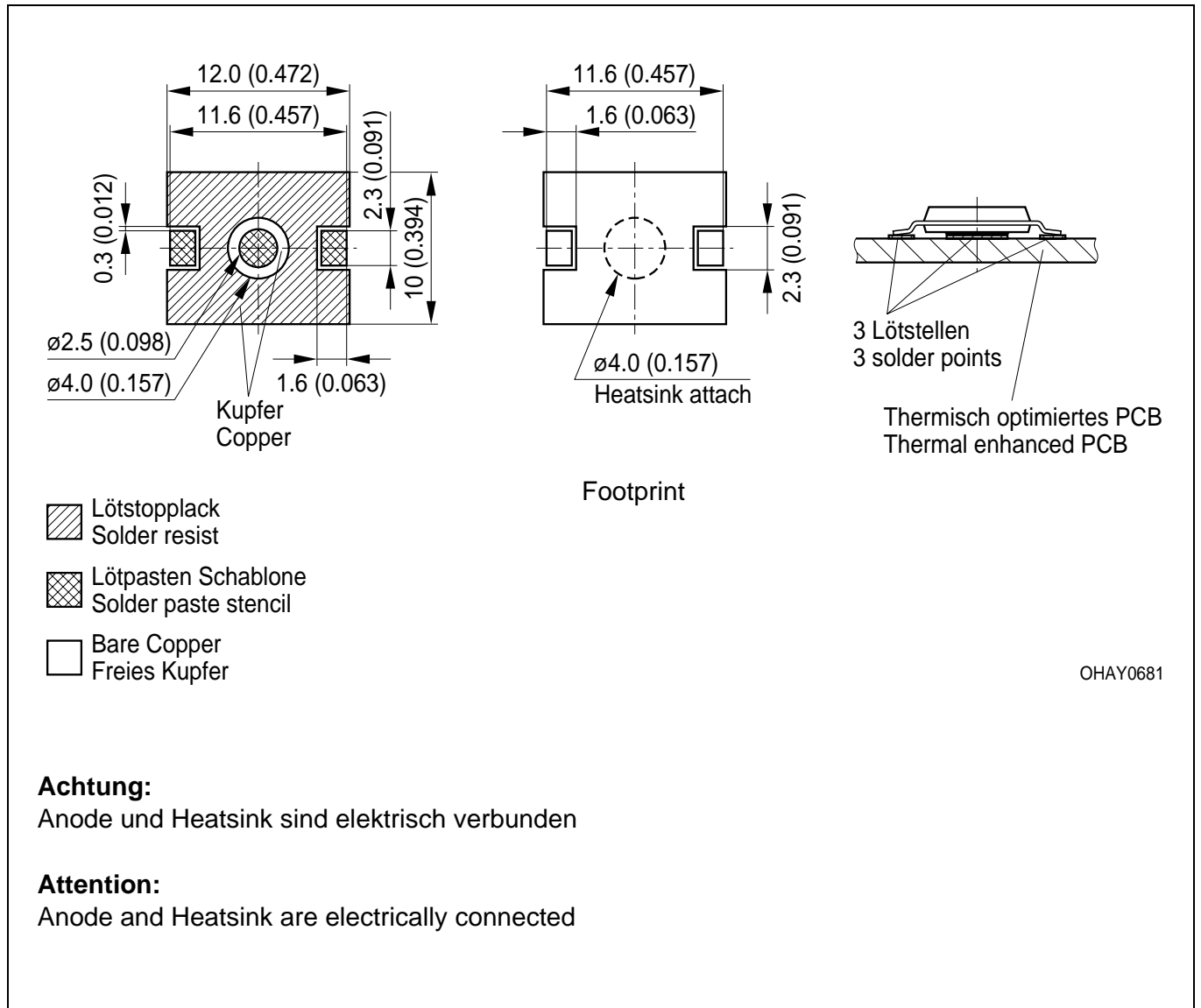
**Gurtung / Polarität und Lage**  
**Method of Taping / Polarity and Orientation**

Verpackungseinheit 800/Rolle,  $\varnothing 180$  mm  
Packing unit 800/reel,  $\varnothing 180$  mm



<sup>1)</sup> Maße in mm (inch) / Dimensions in mm (inch)

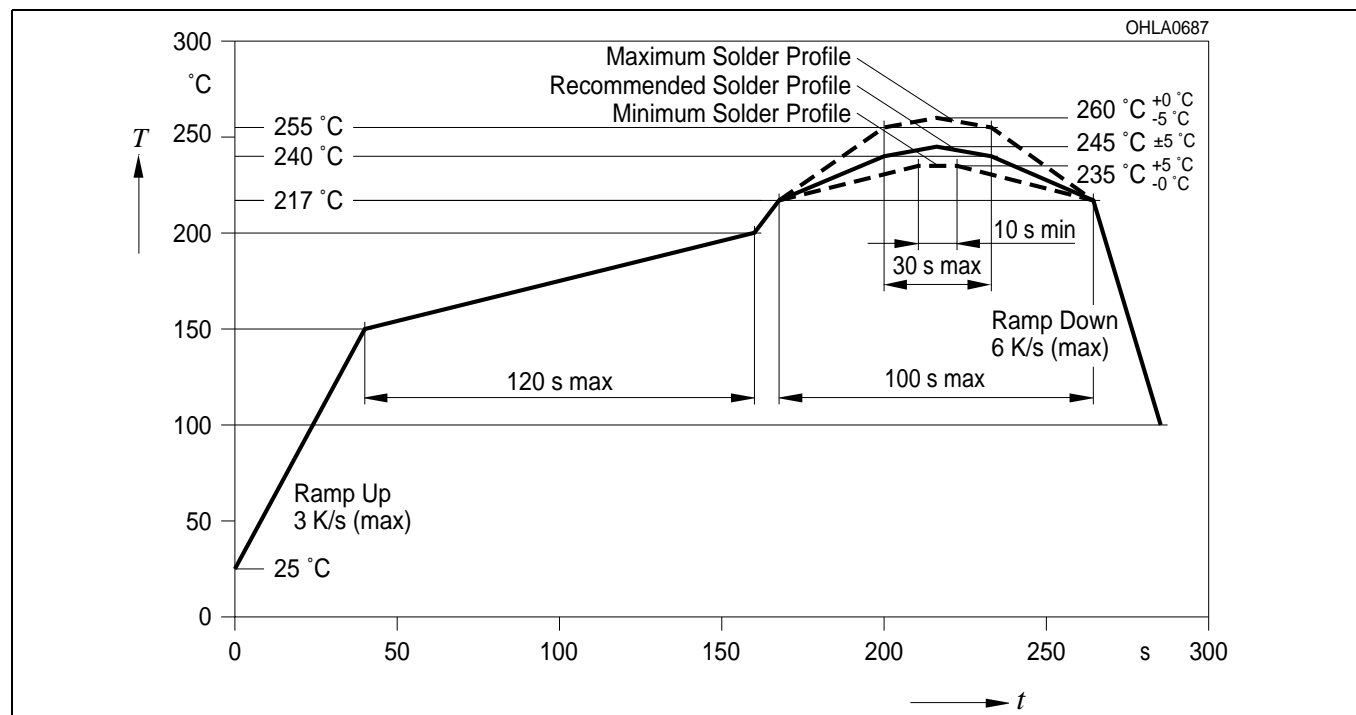
**Empfohlenes Lötpaddesign**  
**Recommended Solder Pad Design**



## Lötbedingungen Soldering Conditions

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

Vorbehandlung nach JEDEC Level 4  
Preconditioning acc. to JEDEC Level 4  
(nach J-STD-020C)  
(acc. to J-STD-020C)



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EU RoHS and China RoHS compliant product



此产品符合欧盟 RoHS 指令的要求；

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