

**IR-Lumineszenzdiode (850 nm) mit hoher Ausgangsleistung**  
**High Power Infrared Emitter (850 nm)**  
**Lead (Pb) Free Product - RoHS Compliant**  
**SFH 4230**



**Wesentliche Merkmale**

- Punktlichtquelle mit hohem Wirkungsgrad bei geringer Baugröße
- Chipgröße (emittierende Fläche) 1 x 1 mm<sup>2</sup>
- max. Gleichstrom 1 A
- niedriger Wärmewiderstand (15 K/W)
- Emissionswellenlänge 850 nm
- ESD-sicher bis 2 kV nach JESD22-A114-B

**Anwendungen**

- Infrarotbeleuchtung für CMOS 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**

- Point lightsource with high efficiency and small package
- die-size (emitting area) 1 x 1 mm<sup>2</sup>
- max. DC-current 1 A
- Low thermal resistance (15 K/W)
- Maximum of spectral emission at 850 nm
- ESD safe up to 2 kV acc. to JESD22-A114-B

**Applications**

- Infrared Illumination for CMOS 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 4230	Q65110A4023	typ. 440

<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 $I_F = 1\text{ A}$ , $t_p = 10\text{ ms}$	$\lambda_{peak}$	850	nm
Centroid-Wellenlänge der Strahlung Centroid wavelength $I_F = 1\text{ A}$ , $t_p = 10\text{ ms}$	$\lambda_{centroid}$	845	nm
Spektrale Bandbreite bei 50% von $I_{max}$ Spectral bandwidth at 50% of $I_{max}$ $I_F = 1\text{ A}$ , $t_p = 10\text{ ms}$	$\Delta\lambda$	40	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	$L \times B$ $L \times W$	$1 \times 1$	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%, $I_F = 1\text{ A}$ , $R_L = 50\ \Omega$	$t_r, t_f$	10	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 $V_F$ $I_F = 1\text{ A}$ , $t_p = 10\text{ ms}$	$TC_V$	- 0.2	mV/K
Temperaturkoeffizient von $\lambda$ Temperature coefficient of $\lambda$ $I_F = 1\text{ A}$ , $t_p = 10\text{ ms}$	$TC_{\lambda, \text{centroid}}$	+ 0.2	nm/K

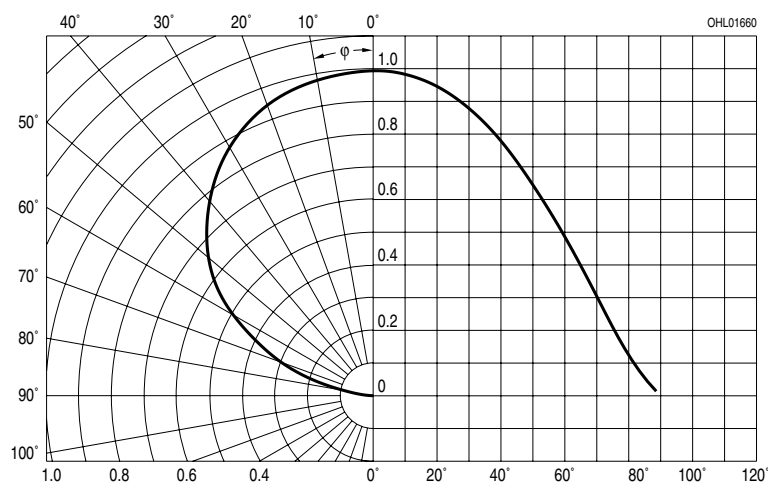
**Gesamtstrahlungsfluss<sup>1)</sup>  $\Phi_e$**   
**Total Radiant Flux<sup>1)</sup>  $\Phi_e$**

Bezeichnung Parameter	Symbol	Werte Values		Einheit Unit
		SFH 4230-CW	SFH 4230-DW	
Gesamtstrahlungsfluss Total Radiant Flux $I_F = 1 \text{ A}, t_p = 100 \mu\text{s}$	$\Phi_{e \text{ min}}$ $\Phi_{e \text{ max}}$	250 500	400 800	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)

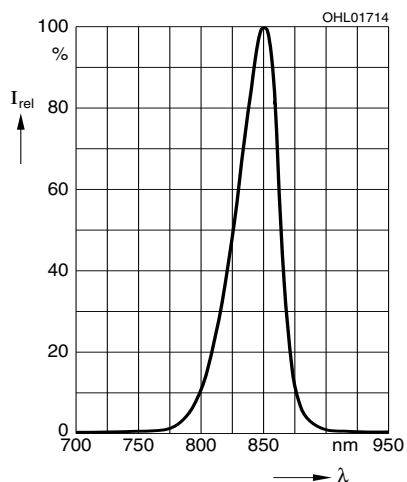
**Abstrahlcharakteristik**

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



**Relative spektrale Emission  
Relative Spectral Emission**

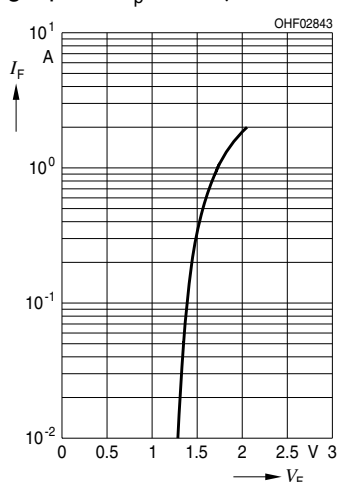
$I_{rel} = f(\lambda)$



**Durchlassstrom  
Forward Current**

$I_F = f(V_F)$

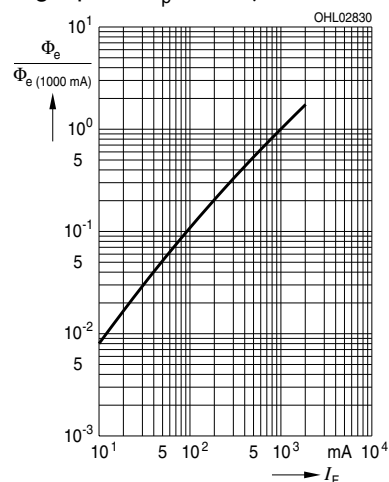
Single pulse,  $t_p = 100 \mu s$



**Relativer Gesamtstrahlungsfluss  
Relative Total Radiant Flux**

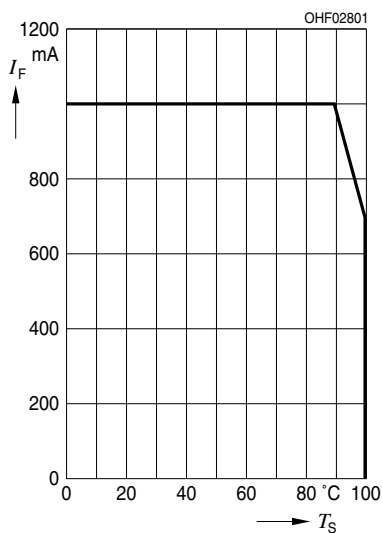
$\Phi_e / \Phi_e(1000mA) = f(I_F)$

Single pulse,  $t_p = 100 \mu s$



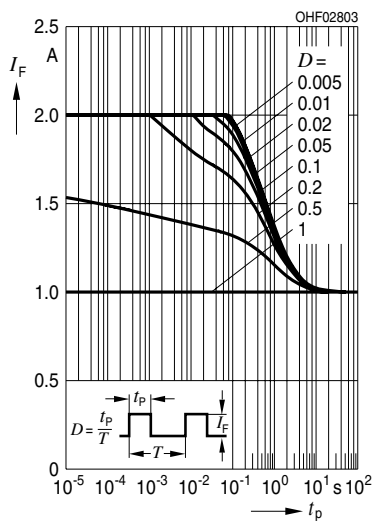
**Max. zulässiger Durchlassstrom  
Max. Permissible Forward Current**

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

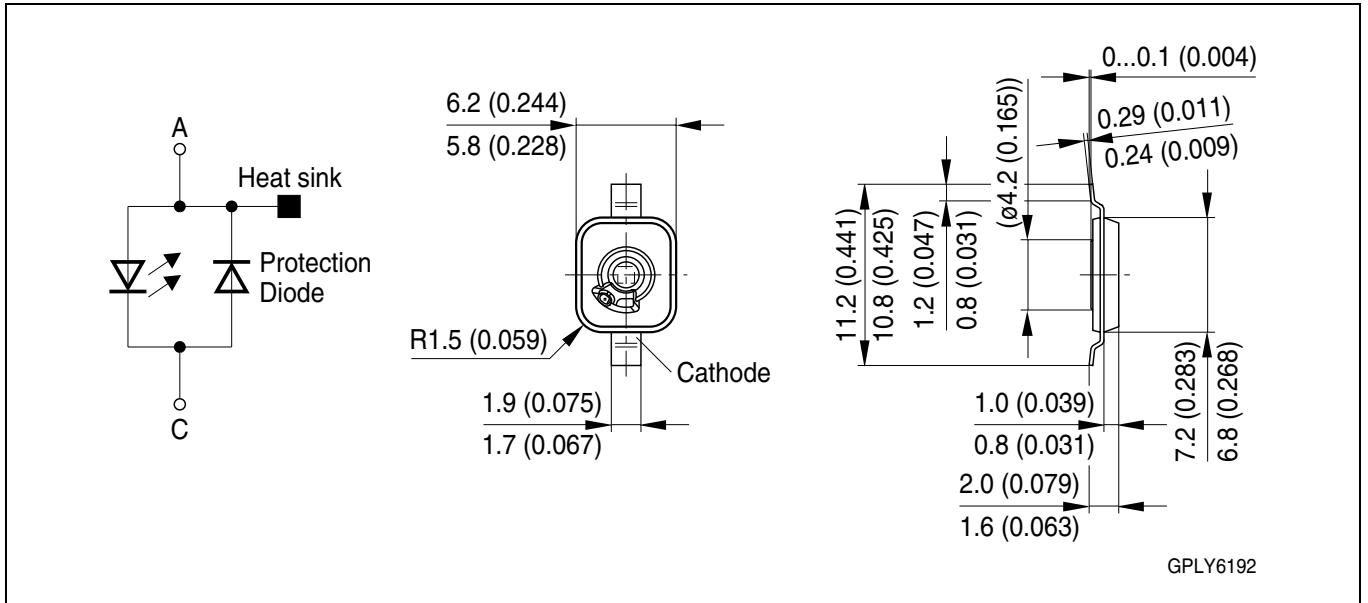


**Zulässige Impulsbelastbarkeit  
Permissible Pulse Handling**

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



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

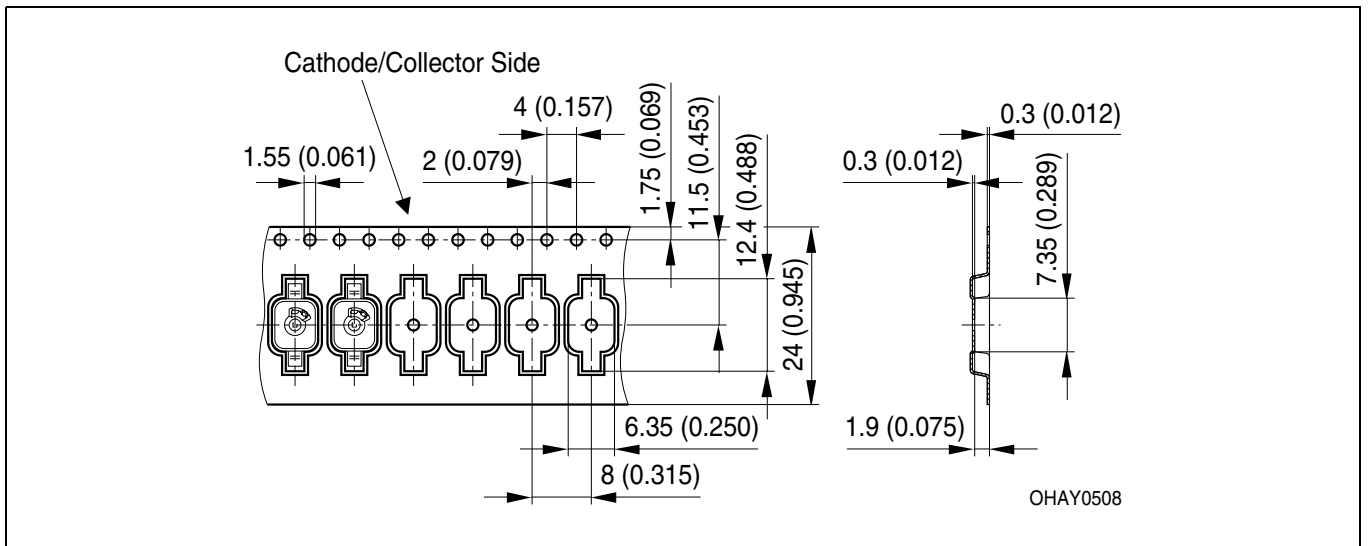


**Kathodenkennung:**  
**Cathode mark:**  
**Gewicht / Approx. weight:**

**Markierung**  
mark  
0.2 g

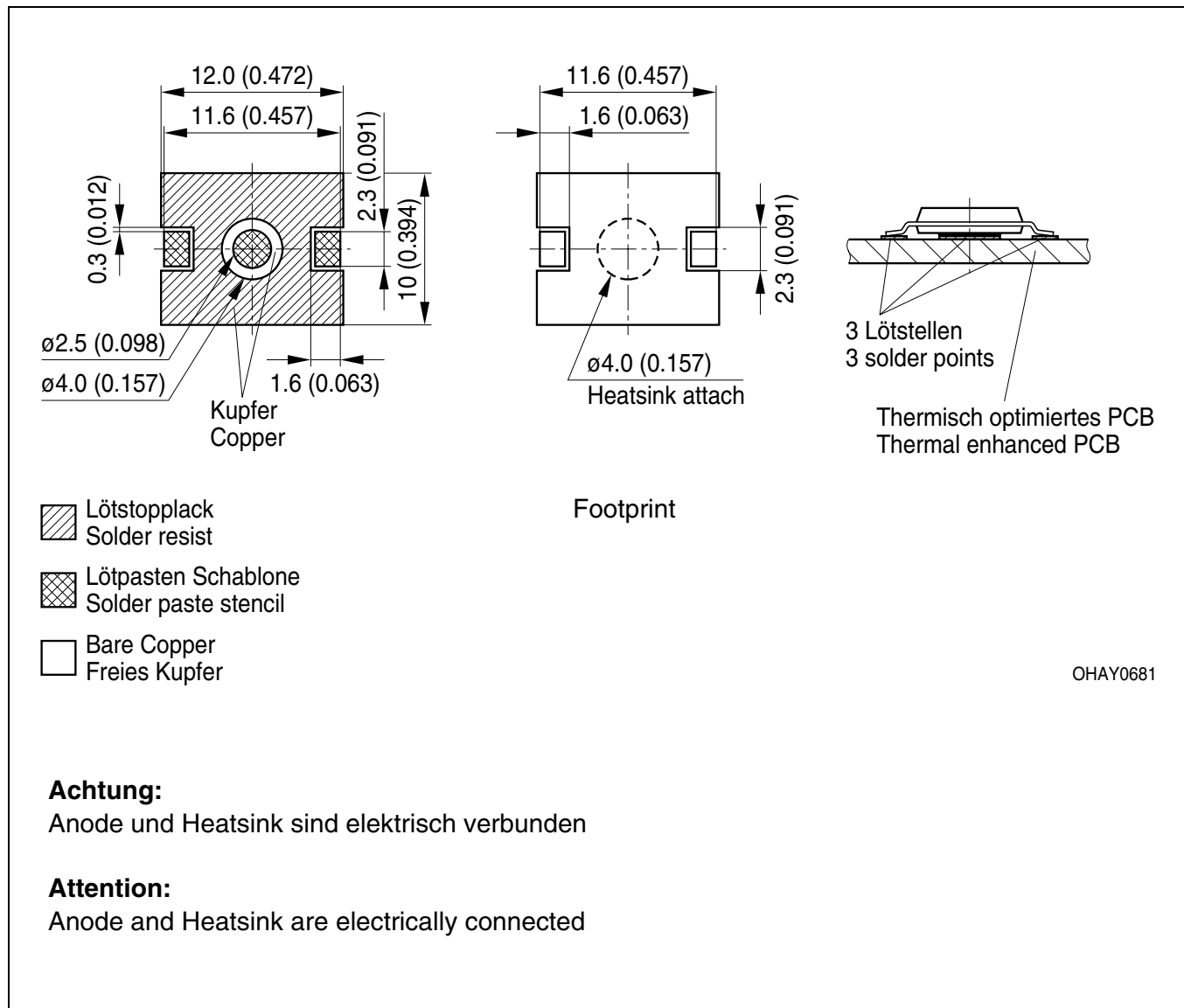
**Gurtung / Polarität und Lage**  
**Method of Taping / Polarity and Orientation**

Verpackungseinheit 800/Rolle, ø180 mm  
Packing unit 800/reel, ø180 mm



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

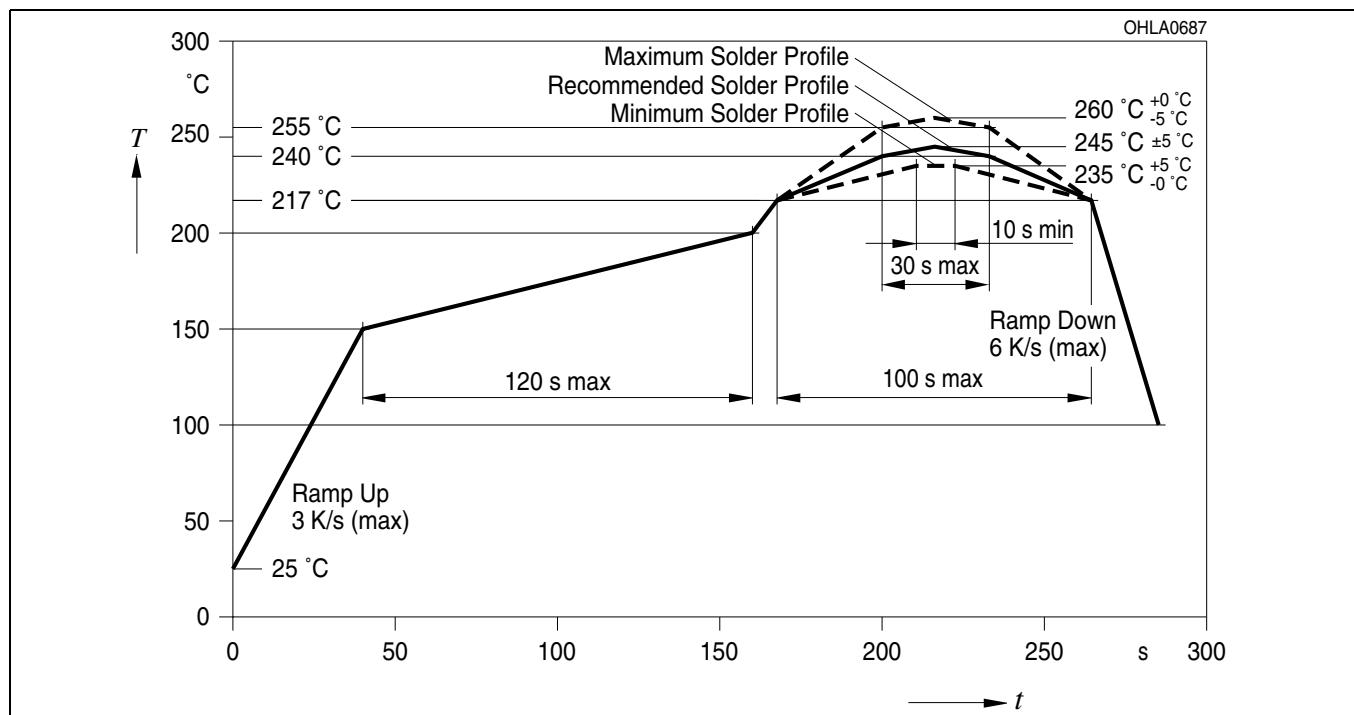
**Empfohlenes Lötpaddesign**  
**Recommended Solder Pad Design**



## 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)



Published by  
OSRAM Opto Semiconductors GmbH  
Wernerwerkstrasse 2, D-93049 Regensburg  
[www.osram-os.com](http://www.osram-os.com)  
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