

**IR-Lumineszenzdiode (850 nm) mit hoher Ausgangsleistung**  
**High Power Infrared Emitter (850 nm)**  
**Lead (Pb) Free Product - RoHS Compliant**  
**SFH 4235**



**Wesentliche Merkmale**

- IR-Lichtquelle mit hohem Wirkungsgrad
- Chipgröße (emittierende Fläche) 1 x 1 mm<sup>2</sup>
- max. Gleichstrom 1 A
- niedriger Wärmewiderstand (9 K/W)
- Schwerpunktwellenlänge 850 nm
- ESD-sicher bis 2 kV nach JESD22-A114-E
- Erweiterte Korrosionsfestigkeit  
(s.a. Abschnitt Maßzeichnung)

**Anwendungen**

- Infrarotbeleuchtung für Kameras
- Überwachungssysteme
- Fahrer-Assistenz Systeme
- Beleuchtung für Bilderkennungssysteme

**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 (9 K/W)
- Center of spectral emission at 850 nm
- ESD safe up to 2 kV acc. to JESD22-A114-E
- Superior Corrosion Robustness  
(see chapter package outlines)

**Applications**

- Infrared Illumination for cameras
- Surveillance systems
- Driver assistance systems
- Machine vision systems

**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 | Gesamtstrahlungsfluss <sup>1)</sup> ( $I_F = 1\text{ A}$ , $t_p = 10\text{ ms}$ )<br>Total Radiant Flux <sup>1)</sup><br>$\Phi_e$ (mW) |
|-------------|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| SFH 4235    | Q65110A8900                    | $\geq 630$ (typ. 950)                                                                                                                  |

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

**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 ... + 125 | °C              |
| Sperrschichttemperatur<br>Junction temperature                                            | $T_J$             | + 145          | °C              |
| Sperrspannung<br>Reverse voltage                                                          | $V_R$             | 1              | V               |
| Vorwärtsgleichstrom<br>Forward current                                                    | $I_F$             | 1              | A               |
| Stoßstrom, $t_p = 200\text{ }\mu\text{s}$ , $D = 0$<br>Surge current                      | $I_{FSM}$         | 5              | A               |
| Leistungsaufnahme<br>Power consumption                                                    | $P_{tot}$         | 3.4            | W               |
| Wärmewiderstand Sperrschicht - Lötstelle<br>Thermal resistance junction - soldering point | $R_{thJS}$        | 9              | 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>$I_F = 1\text{ A}$ , $t_p = 10\text{ ms}$                             | $\lambda_{peak}$             | 860           | nm              |
| Centroid-Wellenlänge der Strahlung<br>Centroid wavelength<br>$I_F = 1\text{ A}$ , $t_p = 10\text{ ms}$                            | $\lambda_{centroid}$         | 850           | nm              |
| Spektrale Bandbreite bei 50% von $I_{max}$<br>Spectral bandwidth at 50% of $I_{max}$<br>$I_F = 1\text{ A}$ , $t_p = 10\text{ ms}$ | $\Delta\lambda$              | 30            | nm              |
| Abstrahlwinkel<br>Half angle                                                                                                      | $\varphi$                    | $\pm 60$      | Grad<br>deg.    |
| Aktive Chipfläche<br>Active chip area                                                                                             | $A$                          | 1             | mm <sup>2</sup> |
| Abmessungen der aktiven Chipfläche<br>Dimension of the active chip area                                                           | $L \times B$<br>$L \times W$ | $1 \times 1$  | mm <sup>2</sup> |

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

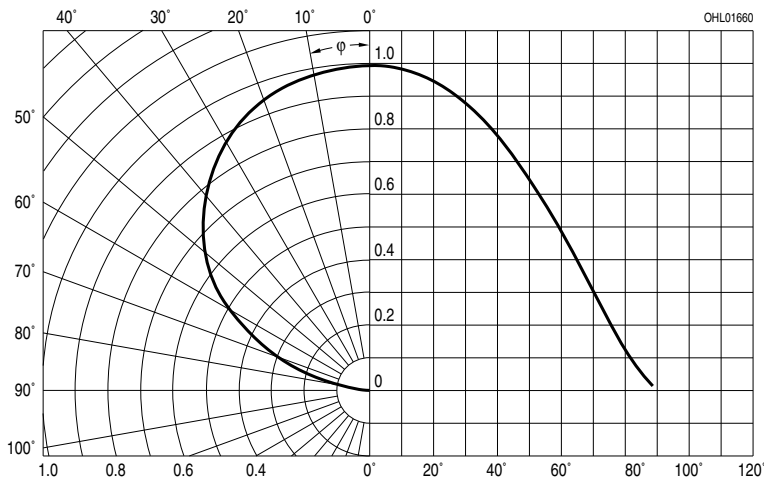
| Bezeichnung<br>Parameter                                                                                                                                                                                            | Symbol<br>Symbol                | Wert<br>Value              | Einheit<br>Unit |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|----------------------------|-----------------|
| Schaltzeiten, $I_e$ von 10% auf 90% und von 90% auf 10%, $I_F = 5\text{ A}$ , $R_L = 50\text{ }\Omega$<br>Switching times, $I_e$ from 10% to 90% and from 90% to 10%, $I_F = 5\text{ A}$ , $R_L = 50\text{ }\Omega$ | $t_r / t_f$                     | 7 / 14                     | ns              |
| Durchlassspannung<br>Forward voltage<br>$I_F = 1\text{ A}$ , $t_p = 100\text{ }\mu\text{s}$<br>$I_F = 5\text{ A}$ , $t_p = 100\text{ }\mu\text{s}$                                                                  | $V_F$<br>$V_F$                  | 3.0 (< 3.4)<br>3.5 (< 4.5) | V<br>V          |
| Strahlstärke<br>Radiant intensity<br>$I_F = 1\text{ A}$ , $t_p = 100\text{ }\mu\text{s}$                                                                                                                            | $I_{e\text{ typ}}$              | 320                        | mW/sr           |
| Temperaturkoeffizient von $I_e$ bzw. $\Phi_e$<br>Temperature coefficient of $I_e$ or $\Phi_e$<br>$I_F = 1\text{ A}$ , $t_p = 10\text{ ms}$                                                                          | $TC_I$                          | - 0.3                      | %/K             |
| Temperaturkoeffizient von $V_F$<br>Temperature coefficient of $V_F$<br>$I_F = 1\text{ A}$ , $t_p = 10\text{ ms}$                                                                                                    | $TC_V$                          | - 2                        | mV/K            |
| Temperaturkoeffizient von $\lambda$<br>Temperature coefficient of $\lambda$<br>$I_F = 1\text{ A}$ , $t_p = 10\text{ ms}$                                                                                            | $TC_{\lambda, \text{centroid}}$ | + 0.3                      | nm/K            |

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

| Bezeichnung<br>Parameter                                                                | Symbol                                           | Werte<br>Values |             | Einheit<br>Unit |
|-----------------------------------------------------------------------------------------|--------------------------------------------------|-----------------|-------------|-----------------|
|                                                                                         |                                                  | -EA             | -EB         |                 |
| Gesamtstrahlungsfluss<br>Total Radiant Flux<br>$I_F = 1 \text{ A}, t_p = 10 \text{ ms}$ | $\Phi_{e \text{ min}}$<br>$\Phi_{e \text{ max}}$ | 630<br>1000     | 800<br>1250 | mW<br>mW        |

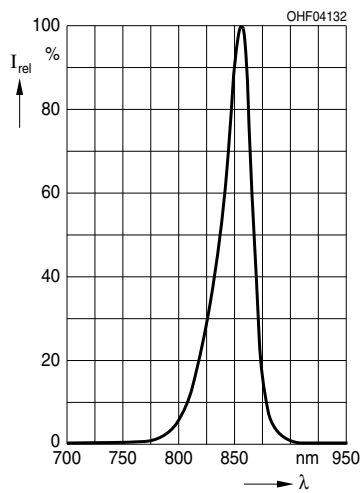
<sup>1)</sup> Nur eine Gruppe in einer Verpackungseinheit (Streuung kleiner 1.6:1) /  
Only one group in one packing unit (variation lower 1.6:1)

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



### Relative spektrale Emission Relative Spectral Emission

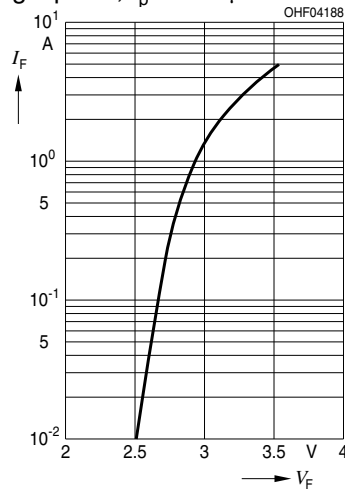
$$I_{\text{rel}} = f(\lambda)$$



### Durchlassstrom Forward Current

$$I_F = f(V_F)$$

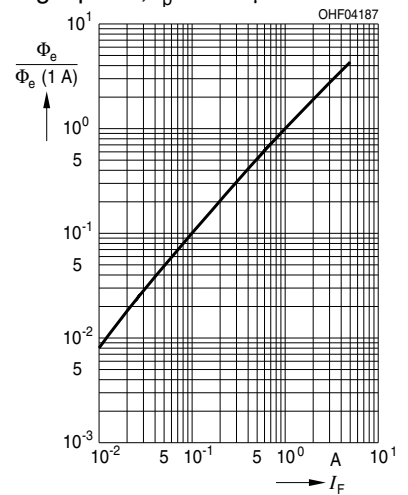
Single pulse,  $t_p = 100 \mu\text{s}$



### Relativer Gesamtstrahlungsfluss Relative Total Radiant Flux

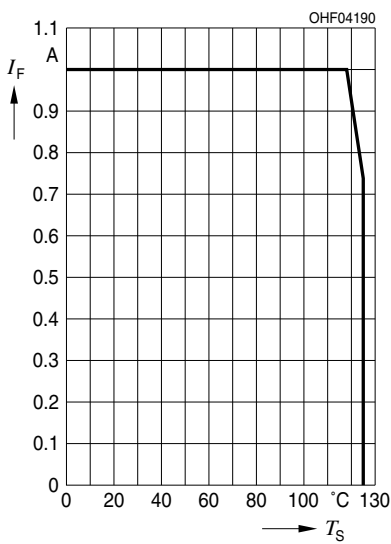
$$\Phi_e / \Phi_e(1\text{A}) = f(I_F)$$

Single pulse,  $t_p = 100 \mu\text{s}$



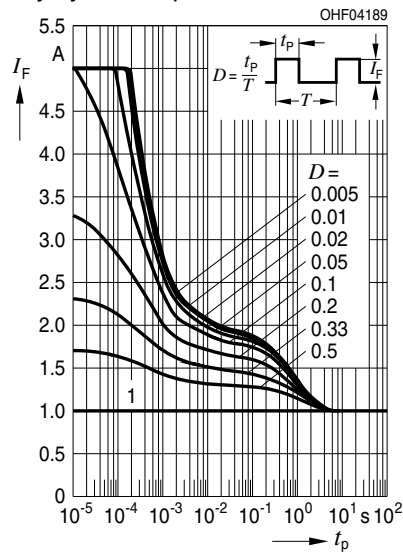
### Max. zulässiger Durchlassstrom Max. Permissible Forward Current

$$I_F = f(T_A), R_{\text{thJS}} = 9 \text{ K/W}$$

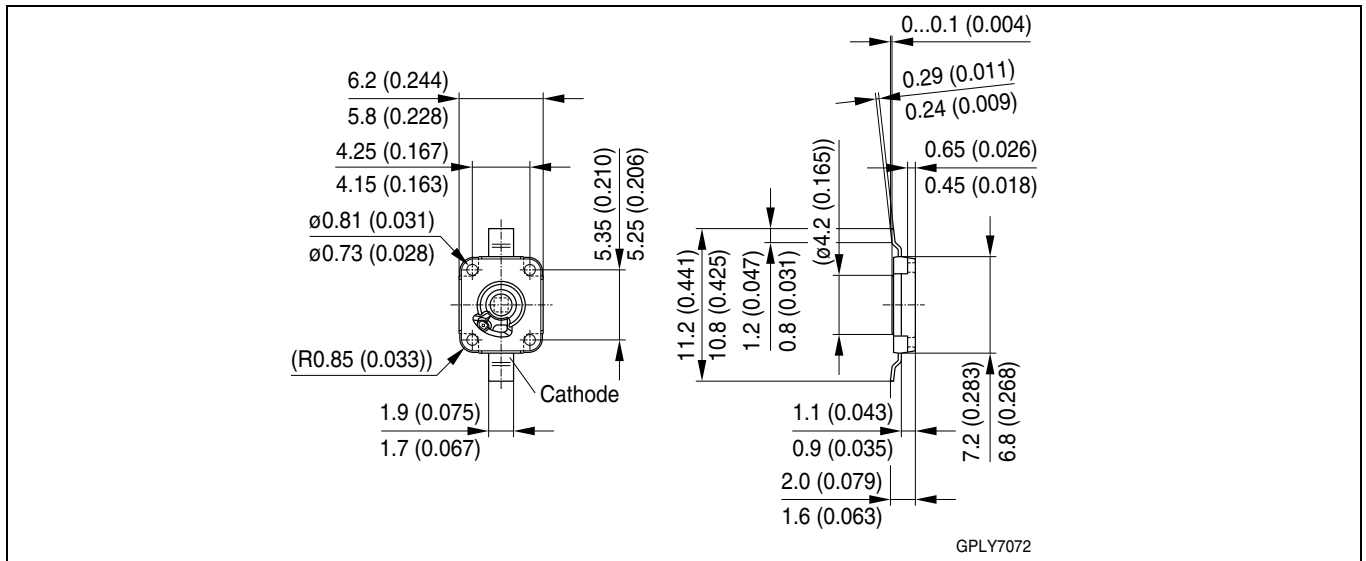


### Zulässige Impulsbelastbarkeit Permissible Pulse Handling

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



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



**Korrosionsfestigkeit besser als EN 60068-2-60 (method 4):**  
mit erweitertem Korrosionstest: 40°C / 90%rh / 15ppm H<sub>2</sub>S / 336h

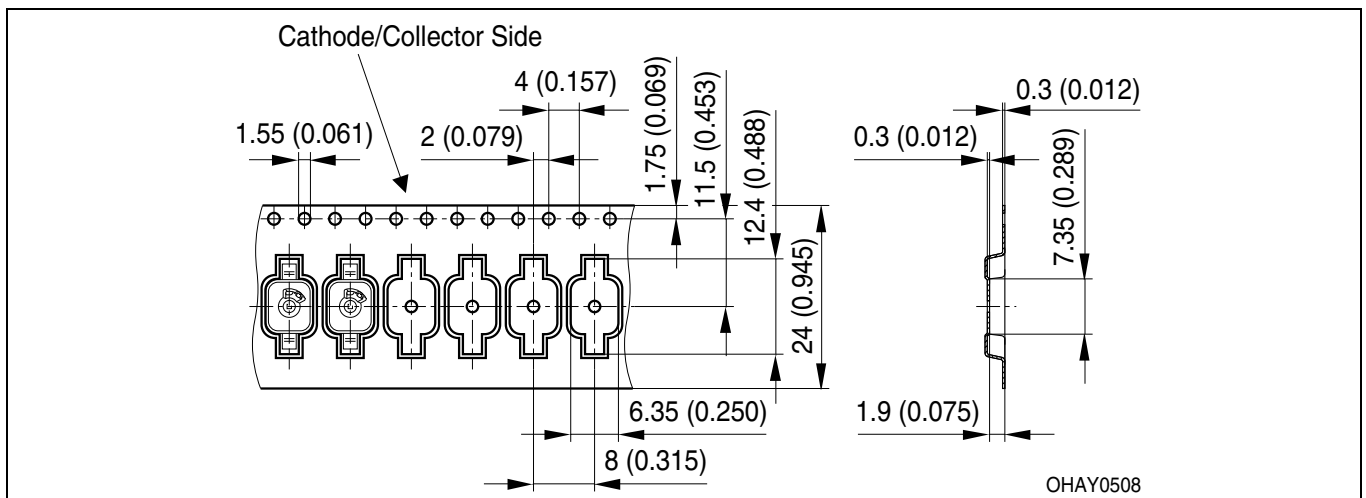
**Corrosion robustness better than EN 60068-2-60 (method 4):**  
with enhanced corrosion test: 40°C / 90%rh / 15ppm H<sub>2</sub>S / 336h

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

**Markierung**  
**mark**  
**0.2 g**

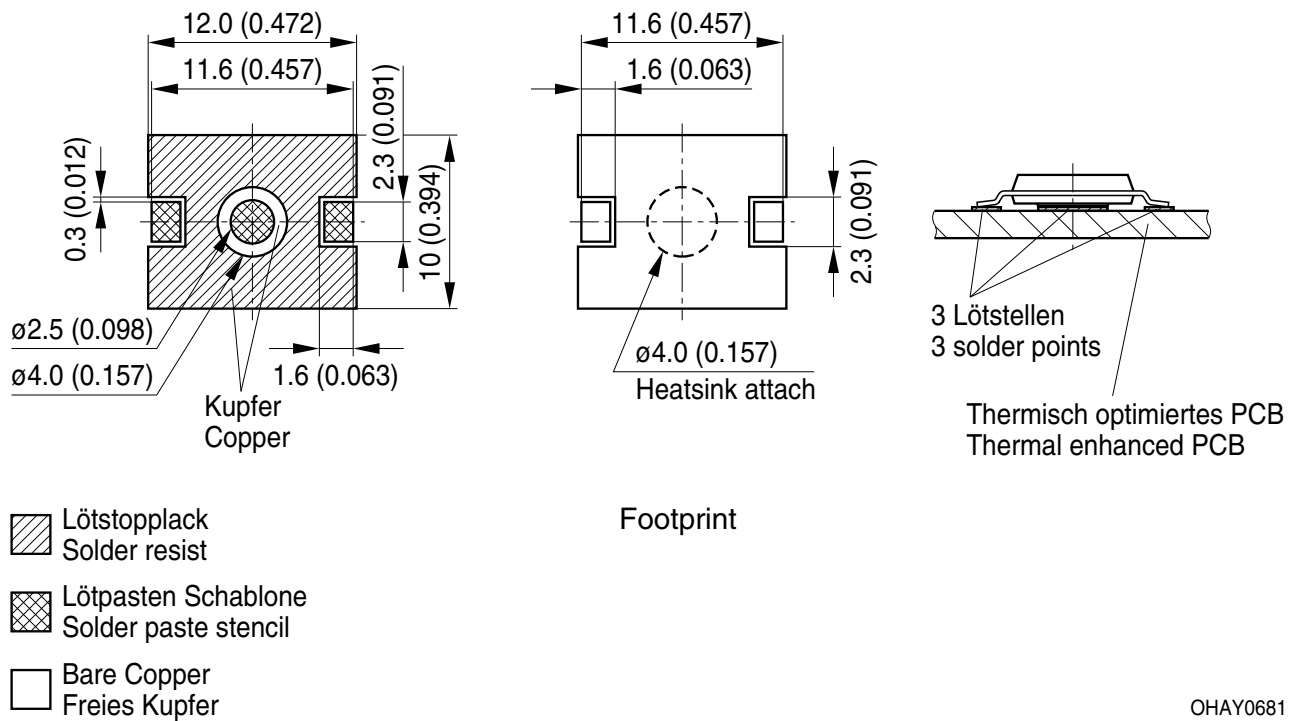
**Gurtung / Polarität und Lage**  
**Method of Taping / Polarity and Orientation**

**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



### Achtung:

Anode und Heatsink sind elektrisch verbunden

### Attention:

Anode and Heatsink are electrically connected

## Lötbedingungen Soldering Conditions

### Reflow Lötprofil für bleifreies Lötén

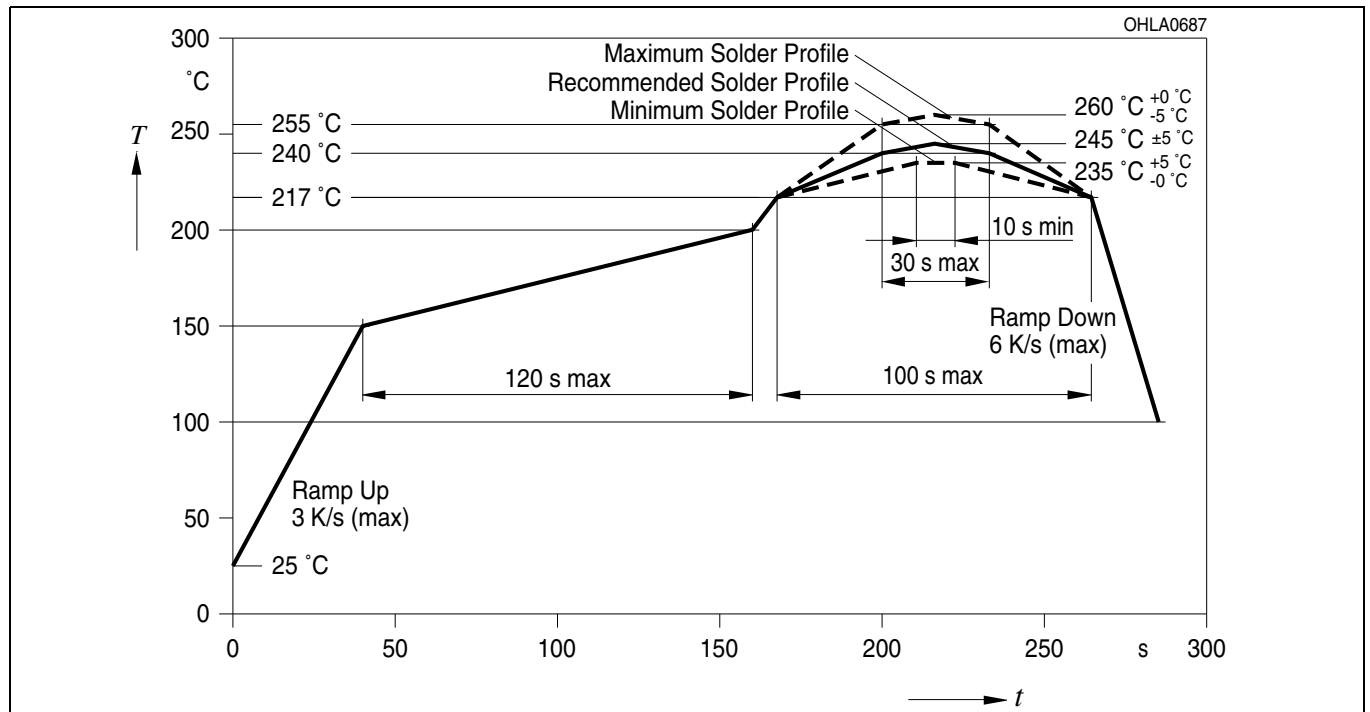
### Reflow Soldering Profile for lead free soldering

Vorbehandlung nach JEDEC Level 2

Preconditioning acc. to JEDEC Level 2

(nach J-STD-020C)

(acc. to J-STD-020C)



Published by  
OSRAM Opto Semiconductors GmbH  
Leibnizstraße 4, D-93055 Regensburg

[www.osram-os.com](http://www.osram-os.com)

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