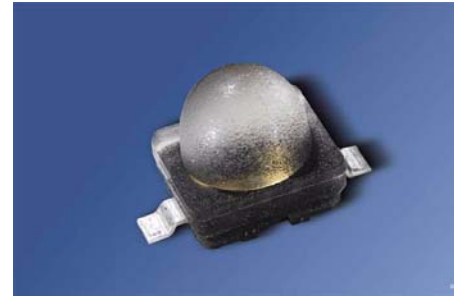


IR-Lumineszenzdiode (940 nm) mit hoher Ausgangsleistung
High Power Infrared Emitter (940 nm)
Lead (Pb) Free Product - RoHS Compliant
SFH 4239



Vorläufige Daten / Preliminary Data

Wesentliche Merkmale

- max. Gleichstrom 1 A
- niedriger Wärmewiderstand (9 K/W)
- Schwerpunktwellenlänge 940 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

- max. DC-current 1 A
- Low thermal resistance (9 K/W)
- Center of spectral emission at 940 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 Type | Bestellnummer Ordering Code | Strahlstärkegruppierung ¹⁾ ($I_F = 1 \text{ A}$, $t_p = 100 \mu\text{s}$) Radiant Intensity Grouping ¹⁾ I_e (mW/sr) |
|-------------|--------------------------------|--|
| SFH 4239 | Q65110A9549 | > 250 (typ. 550) |

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

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 ... + 125 | °C |
| Sperrschichttemperatur Junction temperature | T_J | + 145 | °C |
| Sperrspannung Reverse voltage | V_R | 1 | V |
| Vorwärtsgleichstrom Forward current | I_F | 1 | A |
| Stoßstrom, $t_p < 200\ \mu\text{s}$, $D = 0$ Surge current | I_{FSM} | 5 | A |
| Leistungsaufnahme Power consumption | P_{tot} | 1.8 | W |
| Wärmewiderstand Sperrschicht - Lötstelle Thermal resistance junction - soldering point | R_{thJS} | 9 | K/W |

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

| Bezeichnung Parameter | Symbol Symbol | Wert Value | Einheit Unit |
|---|------------------------------|---------------|-----------------|
| Wellenlänge der Strahlung Wavelength at peak emission $I_F = 1\text{ A}$, $t_p = 10\text{ ms}$ | λ_{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} $I_F = 1\text{ A}$, $t_p = 10\text{ ms}$ | $\Delta\lambda$ | 35 | nm |
| Abstrahlwinkel Half angle | φ | ± 20 | Grad deg. |
| Aktive Chipfläche Active chip area | A | 1 | mm ² |
| Abmessungen der aktiven Chipfläche Dimension of the active chip area | $L \times B$ $L \times W$ | 1×1 | mm ² |

Kennwerte ($T_A = 25\text{ °C}$)

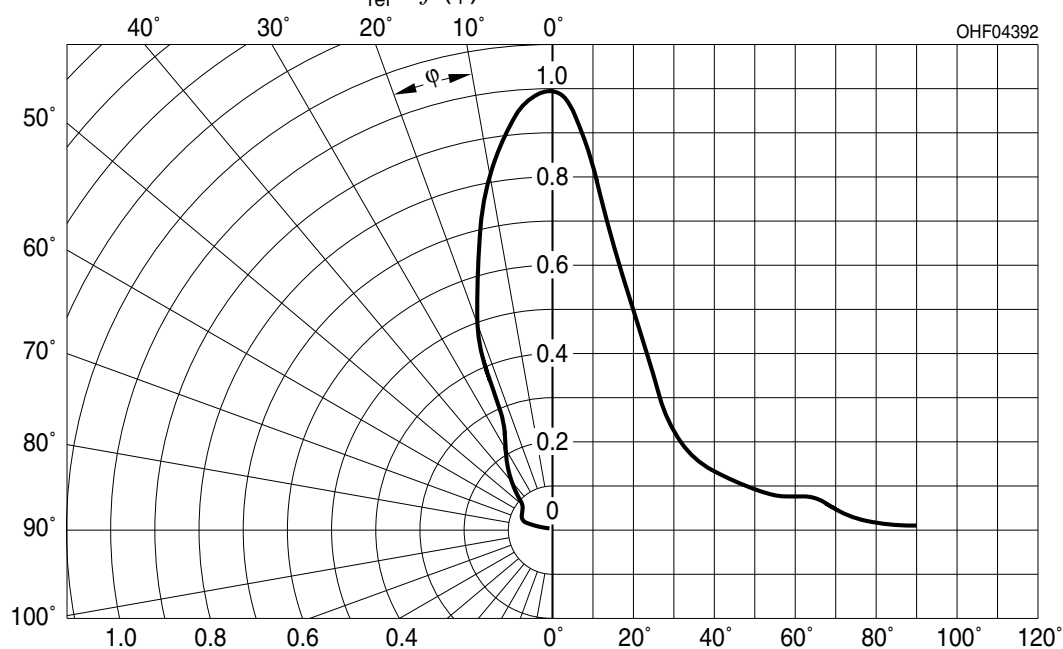
Characteristics (cont'd)

| Bezeichnung Parameter | Symbol Symbol | Wert Value | Einheit Unit |
|---|---------------------------------|----------------------------|-----------------|
| Schaltzeiten, I_e von 10% auf 90% und von 90% auf 10%, $I_F = 5\text{ A}$, $R_L = 50\ \Omega$ Switching times, I_e from 10% to 90% and from 90% to 10%, $I_F = 5\text{ A}$, $R_L = 50\ \Omega$ | t_r / t_f | 8 / 14 | ns |
| Durchlassspannung Forward voltage $I_F = 1\text{ A}$, $t_p = 100\ \mu\text{s}$ $I_F = 5\text{ A}$, $t_p = 100\ \mu\text{s}$ | V_F V_F | 1.4 (< 1.8) 2.0 (< 2.9) | V V |
| Gesamtstrahlungsfluss Total radiant flux $I_F = 1\text{ A}$, $t_p = 100\ \mu\text{s}$ | Φ_e | 460 | mW |
| Temperaturkoeffizient von I_e bzw. Φ_e Temperature coefficient of I_e or Φ_e $I_F = 1\text{ A}$, $t_p = 10\text{ ms}$ | TC_I | - 0.3 | %/K |
| Temperaturkoeffizient von V_F Temperature coefficient of V_F $I_F = 1\text{ A}$, $t_p = 10\text{ ms}$ | TC_V | - 2 | mV/K |
| Temperaturkoeffizient von λ Temperature coefficient of λ $I_F = 1\text{ A}$, $t_p = 10\text{ ms}$ | $TC_{\lambda, \text{centroid}}$ | + 0.3 | 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

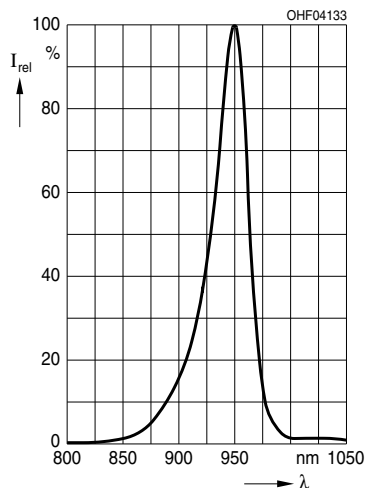
| Bezeichnung Parameter | Symbol | Werte Values | | | Einheit Unit |
|----------------------------|---------------------|-----------------|-----|------|-----------------|
| | | -CW | -DW | -EW | |
| Strahlstärke | $I_{e \text{ min}}$ | 250 | 400 | 630 | mW/sr |
| Radiant intensity | $I_{e \text{ max}}$ | 500 | 800 | 1250 | mW/sr |
| $I_F = 1$ A, $t_p = 10$ ms | | | | | |

- 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 spektrale Emission
Relative Spectral Emission

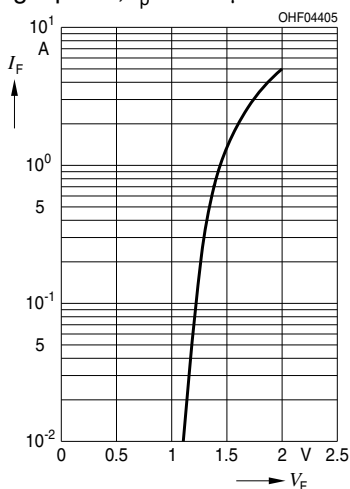
$I_{rel} = f(\lambda)$



Durchlassstrom
Forward Current

$I_F = f(V_F)$

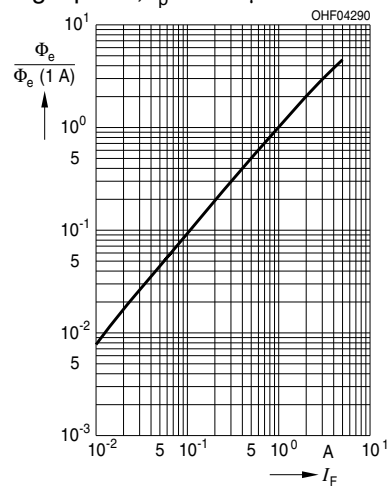
Single pulse, $t_p = 100 \mu s$



Relativer Gesamtstrahlungsfluss
Relative Total Radiant Flux

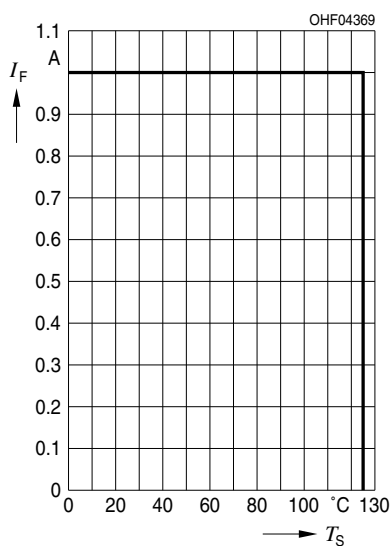
$\Phi_e / \Phi_e(1000mA) = f(I_F)$

Single pulse, $t_p = 100 \mu s$



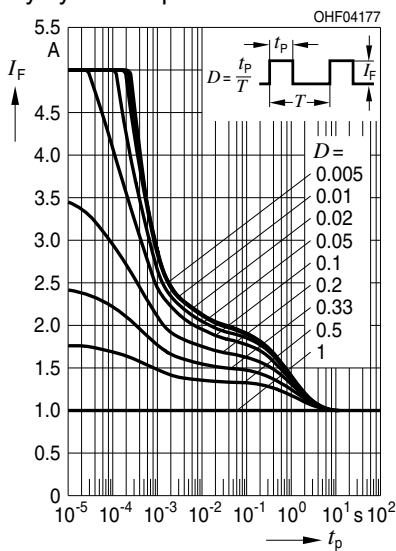
Max. zulässiger Durchlassstrom
Max. Permissible Forward Current

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

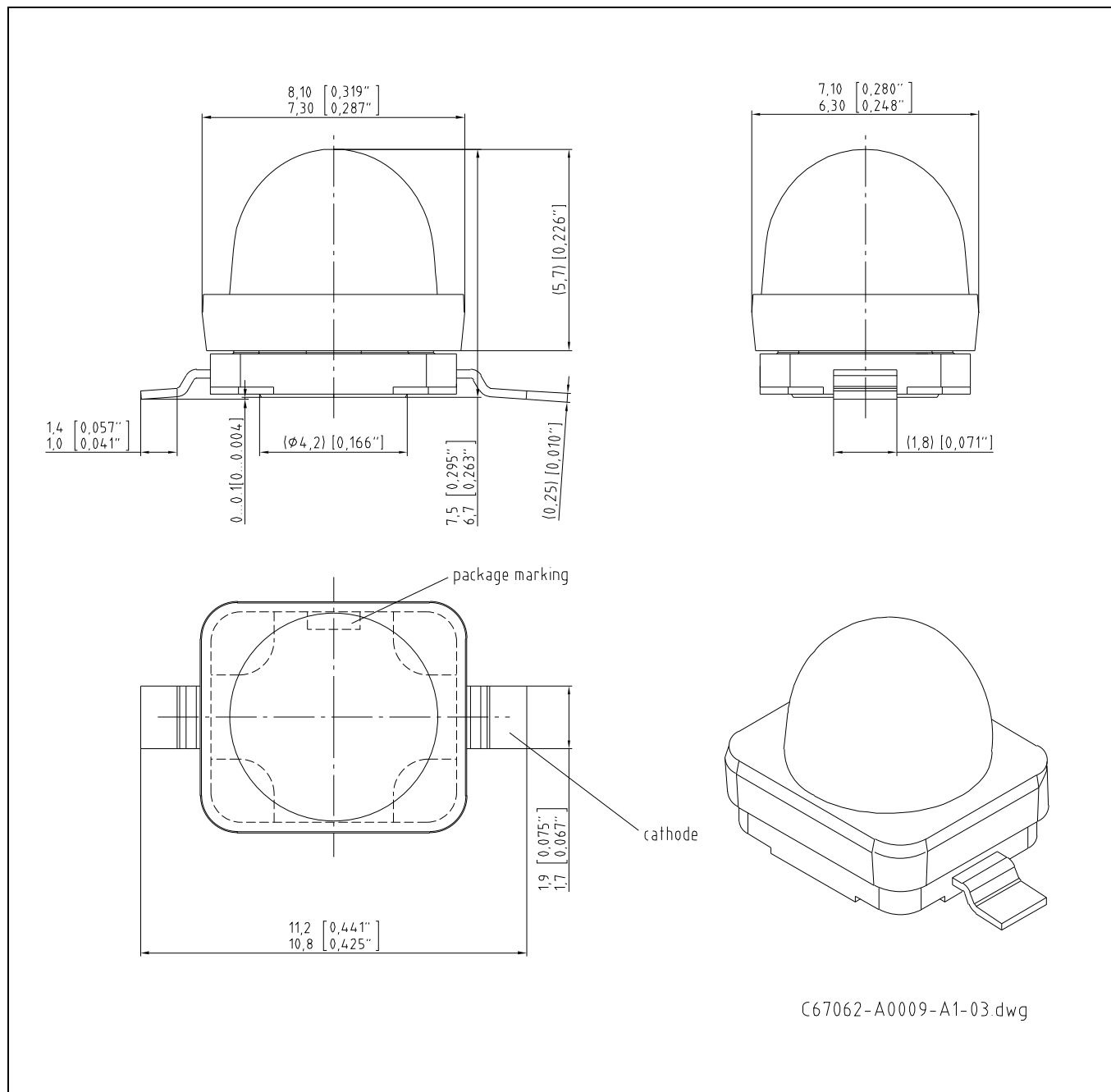


Zulässige Impulsbelastbarkeit
Permissible Pulse Handling

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



Maßzeichnung Package Outlines



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

Korrosionsfestigkeit besser als EN 60068-2-60 (method 4):
mit erweitertem Korrosionstest: 40°C / 90%rh / 15ppm H₂S / 336h

Corrosion robustness better than EN 60068-2-60 (method 4):
with enhanced corrosion test: 40°C / 90%rh / 15ppm H₂S / 336h

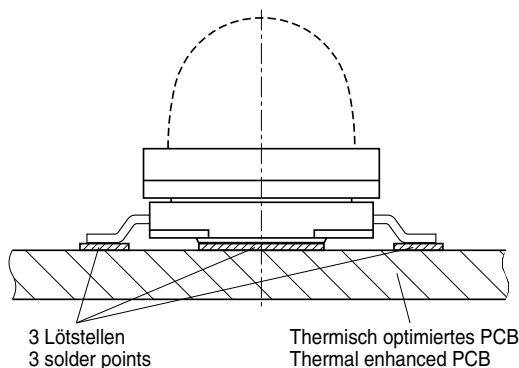
Empfohlenes Lötpaddesign
Recommended Solder Pad Design

Achtung:

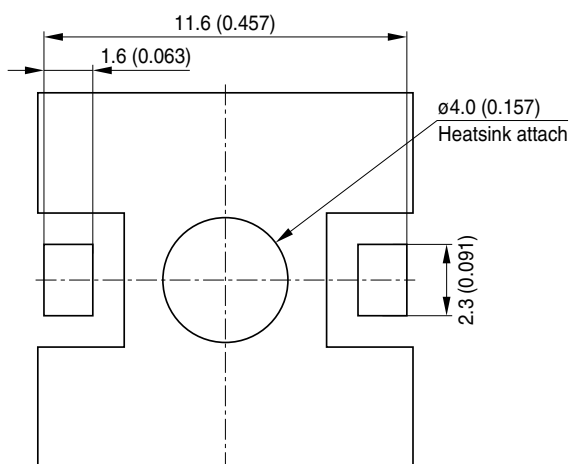
Anode und Heatsink sind elektrisch verbunden

Attention:

Anode and Heatsink are electrically connected

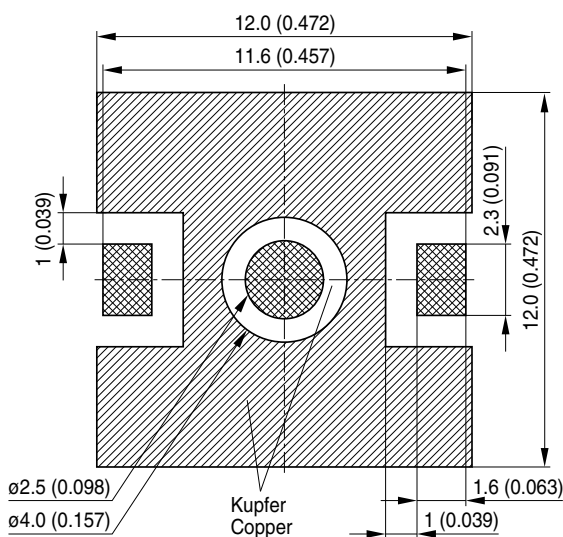





Footprint



Empfohlene Padgeometrie

Recommended Solder Pad Design



-  Lötstopplack
Solder resist
-  Lötpasten Schablone
Solder paste stencil
-  Freies Kupfer
Bare Copper

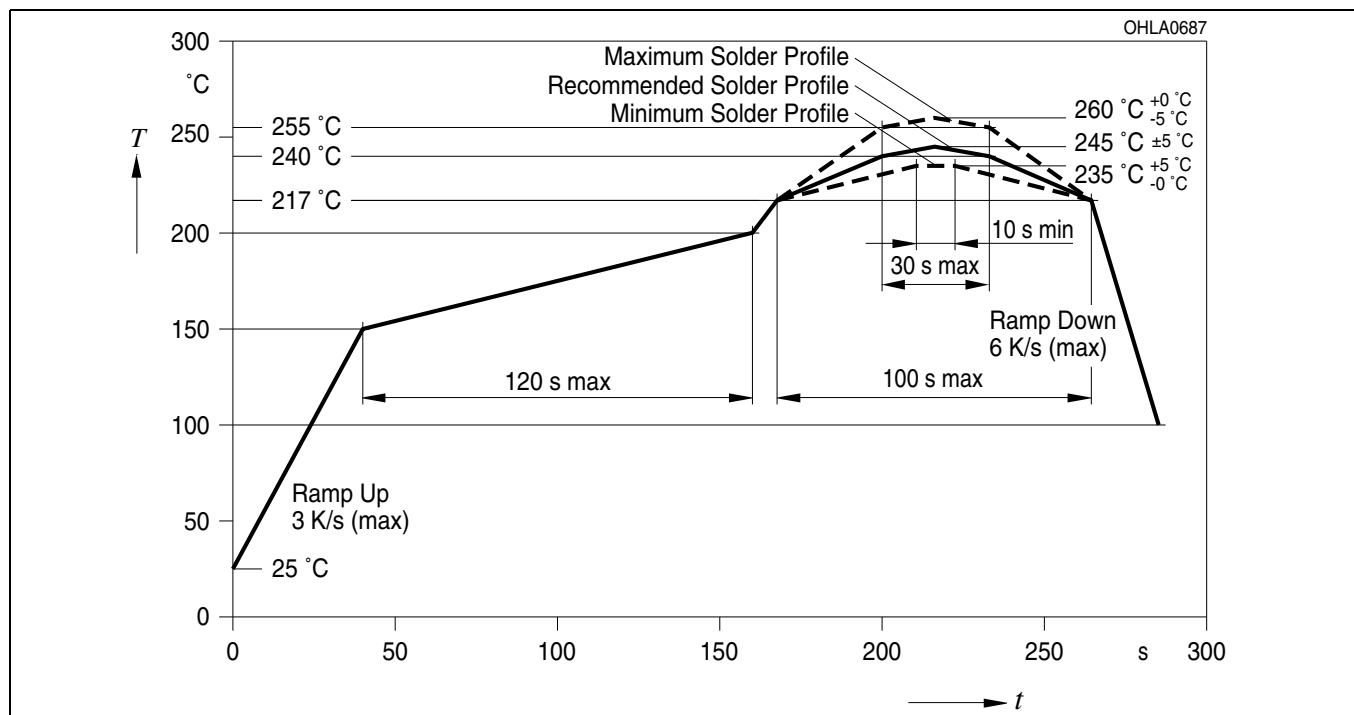
OHPY3638

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

Lötbedingungen Soldering Conditions

Reflow Lötprofil für bleifreies Löt
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)



Anm.: Das Gehäuse ist für Ultraschallreinigung nicht geeignet

Note: Package not suitable for ultra sonic cleaning

Published by
OSRAM Opto Semiconductors GmbH
Leibnizstraße 4, D-93055 Regensburg
www.osram-os.com

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¹ 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.

² 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.

EU RoHS and China RoHS compliant product



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