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

## SFH 4258S
## SFH 4259S

### Wesentliche Merkmale

- Infrarot LED mit hoher Ausgangsleistung
- Halbwinkel SFH 4258S: ± 15°
- Halbwinkel SFH 4259S: ± 25°
- Hohe Bestromung bei hohen Temperaturen möglich
- Kurze Schaltzeiten

### Features

- High Power Infrared LED
- Half angle SFH 4258S: ± 15°
- Half angle SFH 4259S: ± 25°
- High forward current allowed at high temperature
- Short switching times

### Anwendungen

- Industrie Anwendungen
- Infrarotbeleuchtung für Kameras
- IR-Datenübertragung
- Sensorik

### Applications

- industrial applications
- Infrared Illumination for cameras
- IR Data Transmission
- Optical sensors

### 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 Sicherheits-richtlinien der IEC-Normen 60825-1 und 62471 behandelt werden.

### 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** | **Strahlstärkegruppierung**[1] ($I_F$ = 70 mA, $t_p$ = 20 ms)<br>**Radiant Intensity Grouping**[1]<br>$I_e$ (mW/sr) |
|---|---|---|
| SFH 4258S | Q65111A1158 | ≥ 40 (typ. 100) |
| SFH 4259S | Q65111A1159 | ≥ 25 (typ. 60) |

[1] gemessen bei einem Raumwinkel Ω = 0.01 sr / measured at a solid angle of Ω = 0.01 sr

**Grenzwerte** ($T_A$ = 25 °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 … + 85 | °C |
| Sperrspannung<br>Reverse voltage | $V_R$ | 5 | V |
| Vorwärtsgleichstrom<br>Forward current | $I_F$ | 70 | mA |
| Stoßstrom, $t_p$ = 300 µs, $D$ = 0<br>Surge current | $I_{FSM}$ | 700 | mA |
| Verlustleistung<br>Power dissipation | $P_{tot}$ | 245 | mW |
| Wärmewiderstand Sperrschicht - Umgebung bei Montage auf FR4 Platine, Padgröße je 16 mm²<br>Thermal resistance junction - ambient mounted on PC-board (FR4), padsize 16 mm² each | $R_{thJA}$ | 300 | K/W |
| Wärmewiderstand Sperrschicht - Lötstelle bei Montage auf Metall-Block<br>Thermal resistance junction - soldering point, mounted on metal block | $R_{thJS}$ | 140 | K/W |

**Kennwerte** ($T_A$ = 25 °C)
**Characteristics**

| Bezeichnung<br>Parameter | Symbol<br>Symbol | Wert<br>Value | Einheit<br>Unit |
|---|---|---|---|
| Wellenlänge der Strahlung<br>Wavelength at peak emission<br>$I_F$ = 70 mA | $\lambda_{peak}$ | 860 | nm |
| Centroid-Wellenlänge der Strahlung<br>Centroid wavelength<br>$I_F$ = 70 mA | $\lambda_{centroid}$ | 850 | nm |
| Spektrale Bandbreite bei 50% von $I_{max}$<br>Spectral bandwidth at 50% of $I_{max}$<br>$I_F$ = 70 mA | $\Delta\lambda$ | 30 | nm |
| Abstrahlwinkel<br>Half angle<br>SFH 4258S<br>SFH 4259S | <br><br>$\varphi$<br>$\varphi$ | <br><br>± 15<br>± 25 | <br><br>Grad<br>deg. |

**Kennwerte** ($T_A$ = 25 °C)
**Characteristics** (cont'd)

| **Bezeichnung**<br>**Parameter** | **Symbol**<br>**Symbol** | **Wert**<br>**Value** | **Einheit**<br>**Unit** |
|---|---|---|---|
| Aktive Chipfläche<br>Active chip area | $A$ | 0.09 | $mm^2$ |
| Abmessungen der aktiven Chipfläche<br>Dimension of the active chip area | $L \times B$<br>$L \times W$ | 0.3 × 0.3 | mm² |
| Schaltzeiten, $I_e$ von 10% auf 90% und von 90% auf 10%, bei $I_F$ = 70 mA, $R_L$ = 50 Ω<br>Switching times, $I_e$ from 10% to 90% and from 90% to 10%, $I_F$ = 70 mA, $R_L$ = 50 Ω | $t_r$, $t_f$ | 15 | ns |
| Durchlassspannung<br>Forward voltage<br>$I_F$ = 70 mA, $t_p$ = 20 ms<br>$I_F$ = 700 mA, $t_p$ = 100 µs | <br><br>$V_F$<br>$V_F$ | <br><br>3 (< 3.5)<br>4 (< 5.2) | <br><br>V<br>V |
| Sperrstrom<br>Reverse current | $I_R$ | not designed for reverse operation | µA |
| Gesamtstrahlungsfluss<br>Total radiant flux<br>$I_F$ = 70 mA, $t_p$ = 20 ms | $\Phi_{e\ typ}$ | 80 | mW |
| Temperaturkoeffizient von $I_e$ bzw. $\Phi_e$, $I_F$ = 70 mA<br>Temperature coefficient of $I_e$ or $\Phi_e$, $I_F$ = 70 mA | $TC_I$ | – 0.5 | %/K |
| Temperaturkoeffizient von $V_F$, $I_F$ = 70 mA<br>Temperature coefficient of $V_F$, $I_F$ = 70 mA | $TC_V$ | – 2 | mV/K |
| Temperaturkoeffizient von λ, $I_F$ = 70 mA<br>Temperature coefficient of λ, $I_F$ = 70 mA | $TC_\lambda$ | + 0.3 | nm/K |

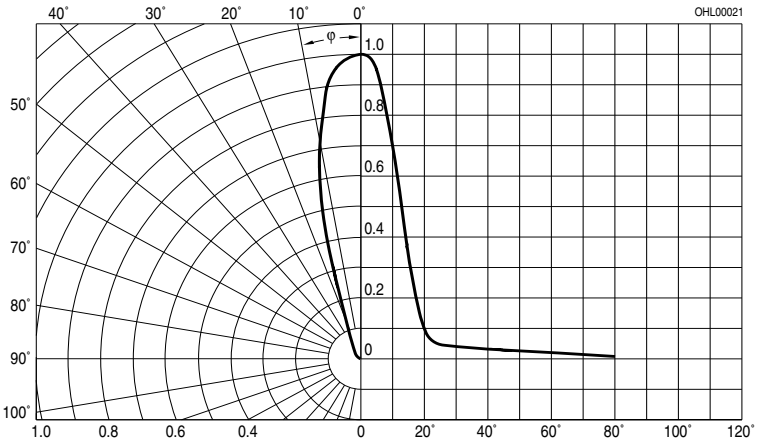
**Strahlstärke $I_e$ in Achsrichtung**[1)]
gemessen bei einem Raumwinkel $\Omega$ = 0.01 sr
**Radiant Intensity $I_e$ in Axial Direction**
at a solid angle of $\Omega$ = 0.01 sr

| Bezeichnung<br>Parameter | Symbol | Werte<br>Values | | | Einheit<br>Unit |
|---|---|---|---|---|---|
| | | SFH 4258S -U | SFH 4258S -V | SFH 4258S -AW | |
| Strahlstärke<br>Radiant intensity<br>$I_F$ = 70 mA, $t_p$ = 20 ms | $I_{e\ min}$<br>$I_{e\ max}$ | 40<br>80 | 63<br>125 | 100<br>200 | mW/sr<br>mW/sr |
| Strahlstärke<br>Radiant intensity<br>$I_F$ = 700 mA, $t_p$ = 25 µs | $I_{e\ typ}$ | 480 | 750 | 1200 | mW/sr |
| | | SFH 4259S -T | SFH 4259S -U | SFH 4259S -V | |
| Strahlstärke<br>Radiant intensity<br>$I_F$ = 70 mA, $t_p$ = 20 ms | $I_{e\ min}$<br>$I_{e\ max}$ | 25<br>50 | 40<br>80 | 63<br>125 | mW/sr<br>mW/sr |
| Strahlstärke<br>Radiant intensity<br>$I_F$ = 700 mA, $t_p$ = 25 µs | $I_{e\ typ}$ | 300 | 480 | 750 | mW/sr |

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

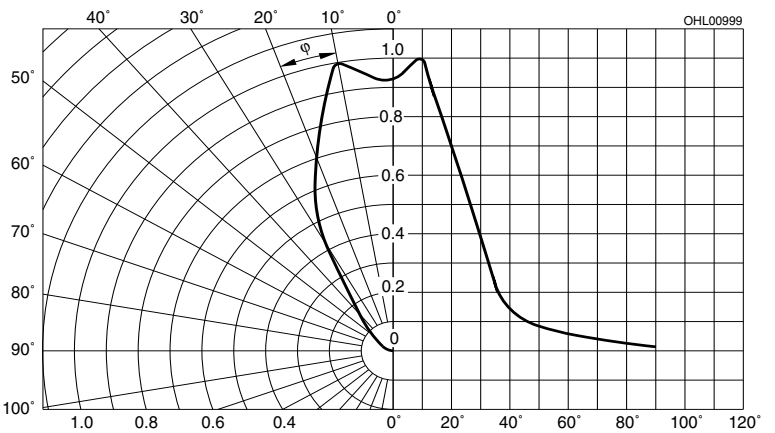
**Abstrahlcharakteristik**
**Radiation Characteristics** $I_{rel} = f(\varphi)$

SFH 4258S

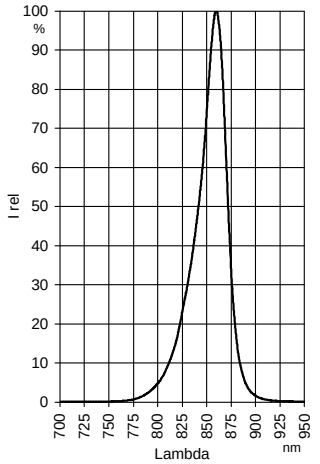



**Abstrahlcharakteristik**
**Radiation Characteristics** $I_{rel} = f(\varphi)$

SFH 4259S

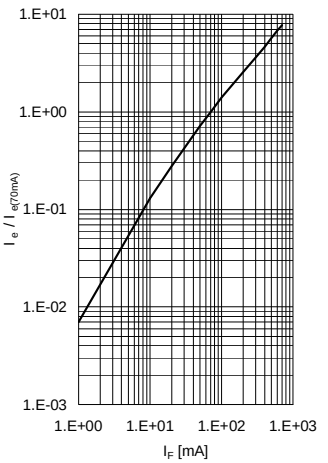


**Relative Spectral Emission**
$I_{rel} = f(\lambda)$

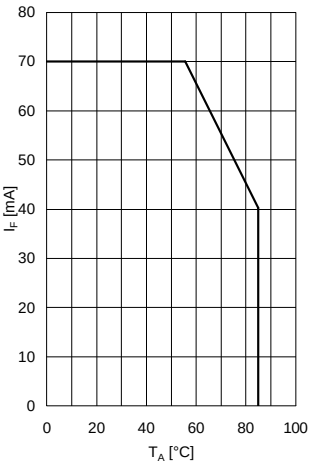



**Radiant Intensity** $\frac{I_e}{I_e\ 70\ mA} = f(I_F)$

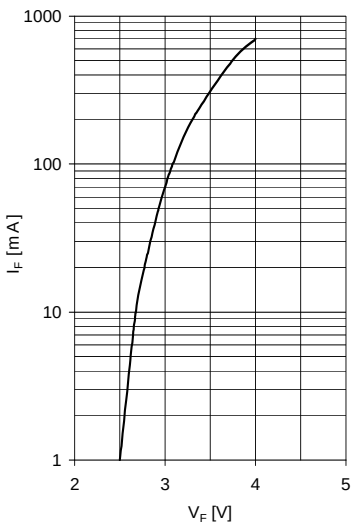
Single pulse, $t_p$ = 25 µs



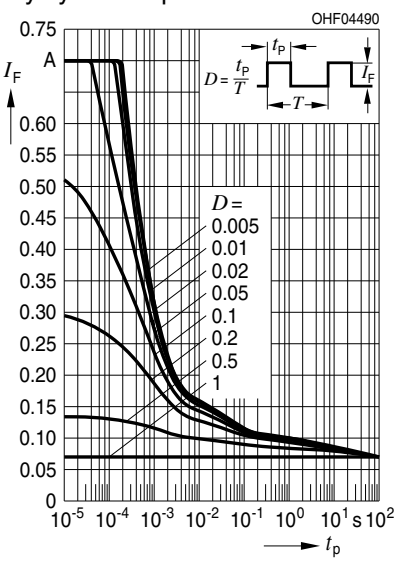

**Max. Permissible Forward Current**
$I_F = f(T_A)$, $R_{thJA}$ = 300 K/W



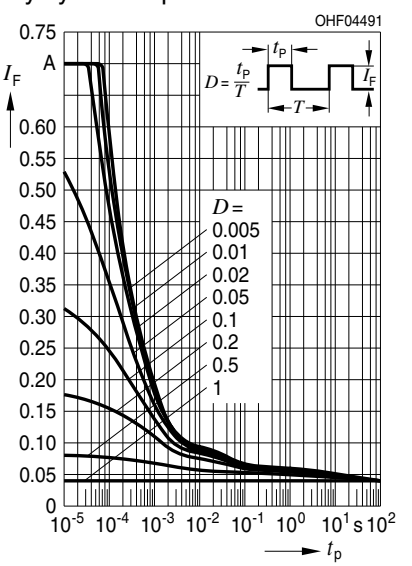

**Forward Current** $I_F = f(V_F)$
Single pulse, $t_p$ = 100 µs




**Permissible Pulse Handling Capability** $I_F = f(\tau)$, $T_A$ = 25 °, duty cycle $D$ = parameter

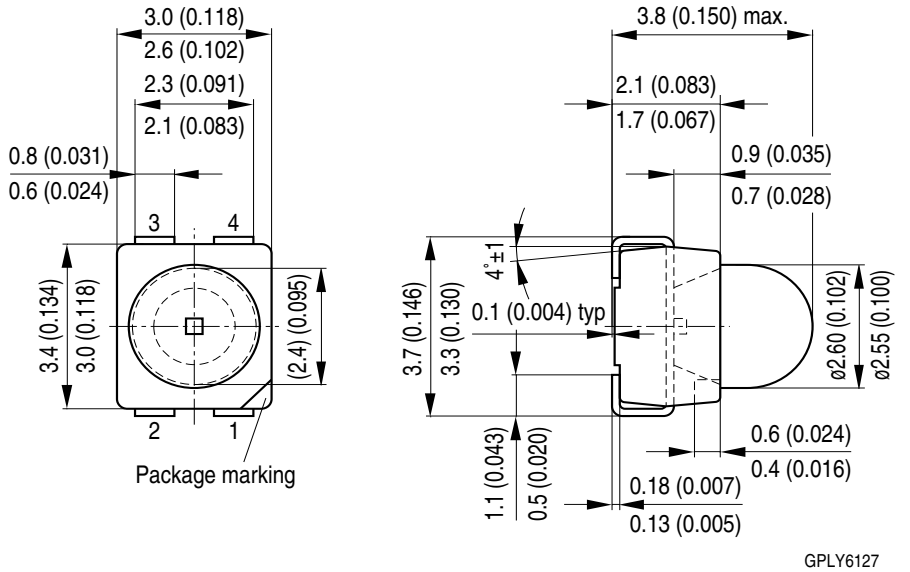



**Permissible Pulse Handling Capability** $I_F = f(\tau)$, $T_A$ = 85 °C, duty cycle $D$ = parameter

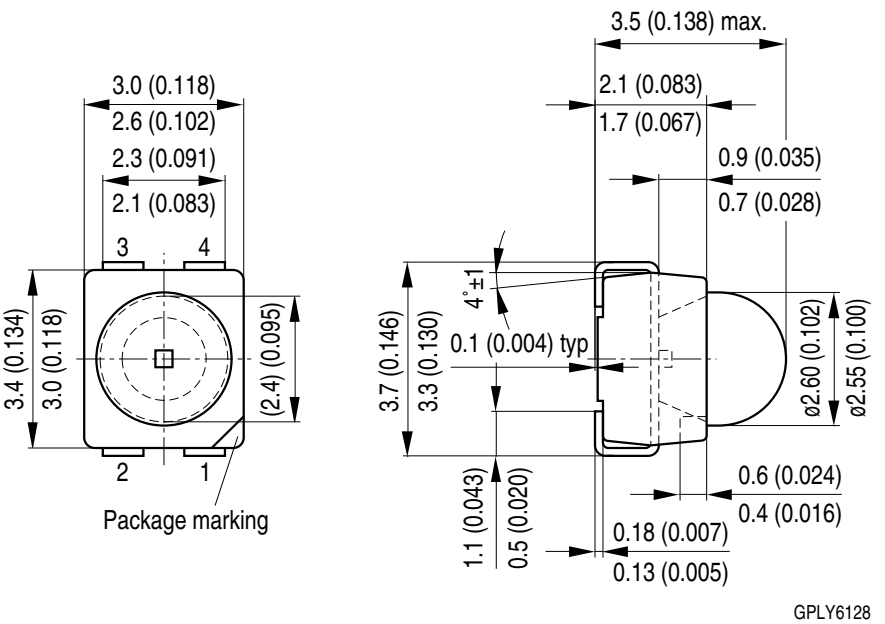


## Maßzeichnung
## Package Outlines

SFH 4258S




SFH 4259S

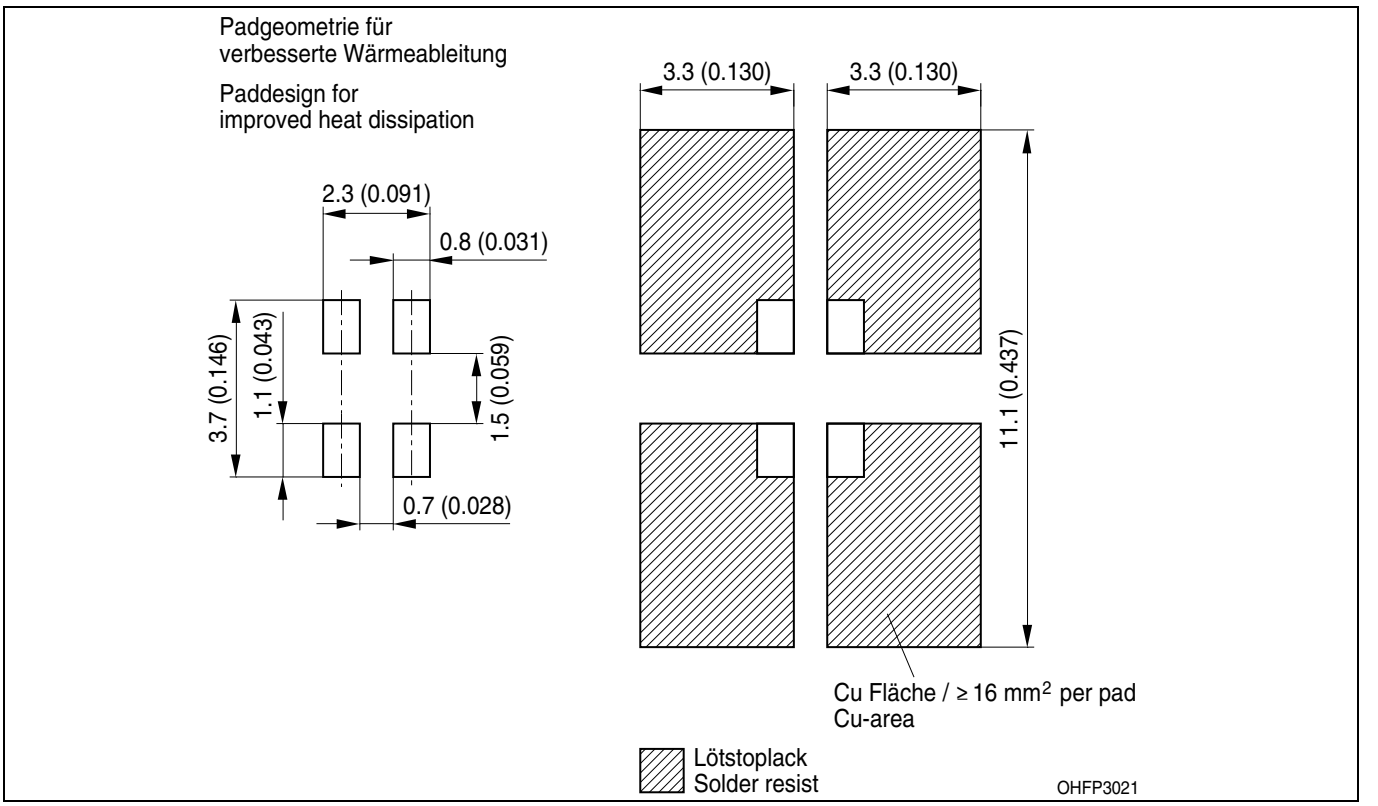



Maße in mm (inch) / Dimensions in mm (inch).

| | |
|---|---|
| Gehäuse / Package | Power TOPLED® mit Linse, klarer Verguss / Power TOPLED® with lens, clear resin |
| Anschlussbelegung<br>pin configuration | 1 = Kathode / cathode<br>2/3/4 = Anode / anode |

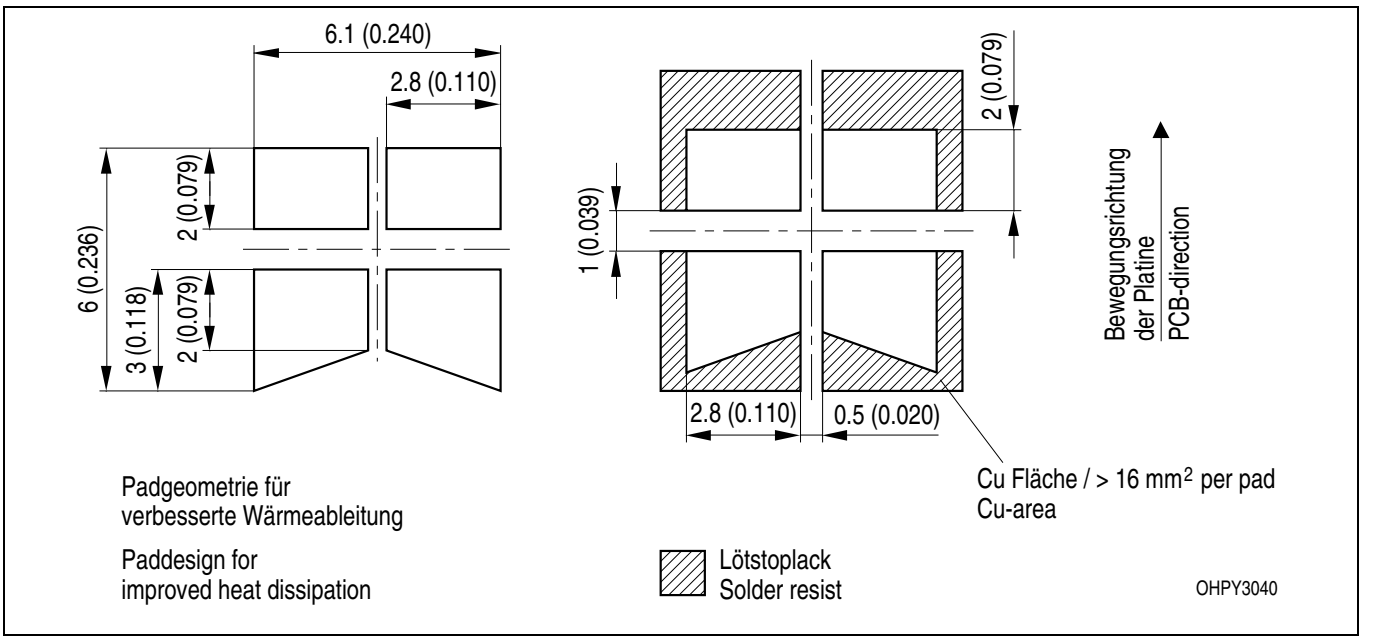
**Empfohlenes Lötpaddesign**
**Recommended Solder Pad Design**

Reflow Löten
Reflow Soldering



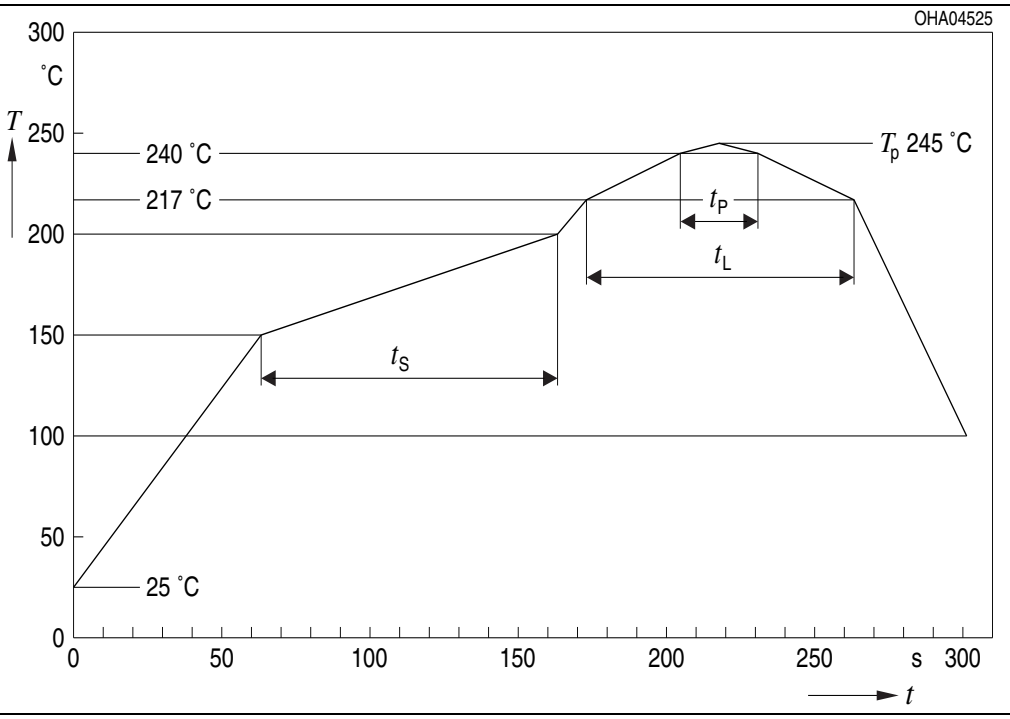

**Empfohlenes Lötpaddesign**
**Recommended Solder Pad Design**

Wellenlöten TTW
TTW Soldering



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

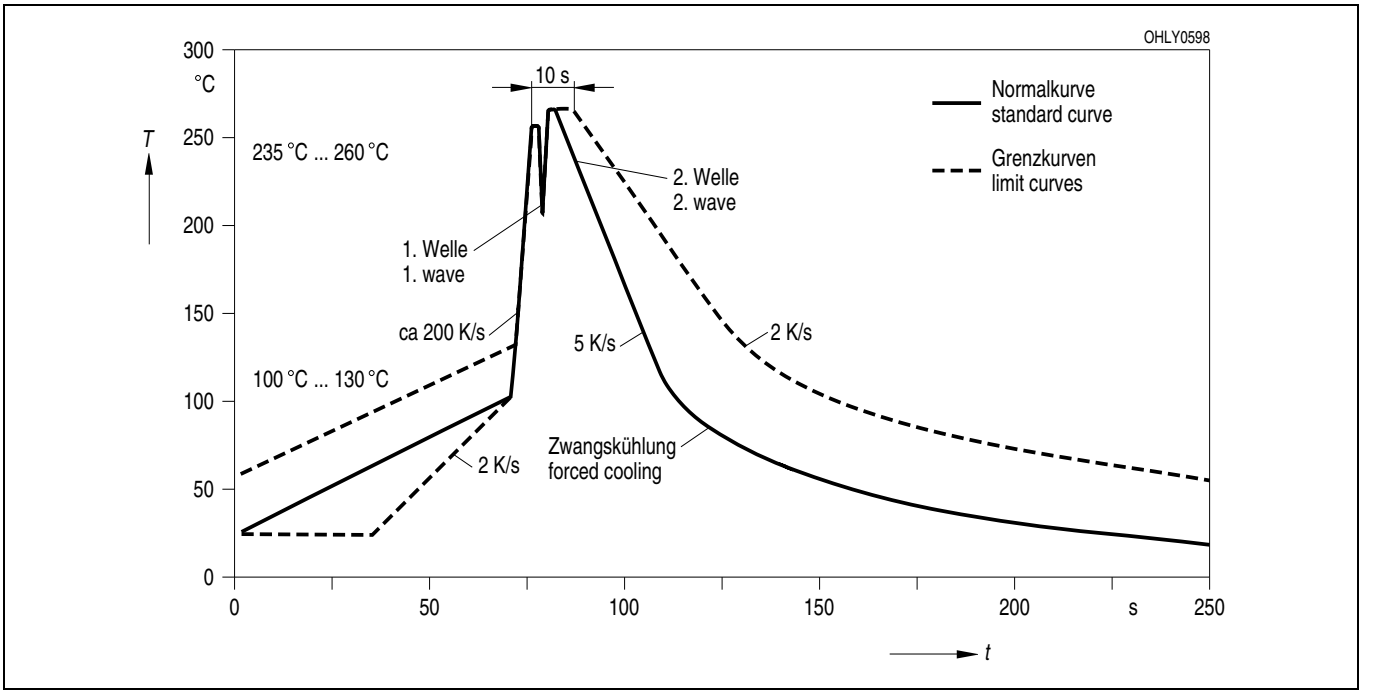
Vorbehandlung nach JEDEC Level 2
Preconditioning acc. to JEDEC Level 2
(nach J-STD-020D.01)
(acc. to J-STD-020D.01)




| Profileigenschaften<br>Profile Feature | Bleifreier Aufbau / Pb-Free Assembly (SnAgCu) | |
|---|---|---|
| | Empfehlung / Recommendation | Grenzwerte / Max. Ratings |
| Aufheizrate zum Vorwärmen*) / Ramp-up rate to preheat*) 25 °C to 150 °C | 2 K / s | 3 K / s |
| Zeit $t_s$ von $T_{Smin}$ bis $T_{Smax}$ / Time $t_s$ from $T_{Smin}$ to $T_{Smax}$ 150 °C to 200 °C | 100 s | min. 60 s max. 120 s |
| Aufheizrate zur Spitzentemperatur*) / Ramp-up rate to peak*) 180 °C to $T_P$ | 2 K / s | 3 K / s |
| Liquidustemperatur $T_L$ / Liquidus temperature $T_L$ | 217 °C | |
| Zeit $t_L$ über $T_L$ / Time $t_L$ above $T_L$ | 80 s | max. 100 s |
| Spitzentemperatur $T_P$ / Peak temperature $T_P$ | 245 °C | max. 250 °C |
| Verweilzeit $t_P$ innerhalb des spezifizierten Spitzentemperaturbereichs $T_P$ - 5 K / Time $t_P$ within the specified peak temperature range $T_P$ - 5 K | 20 s | min. 10 s max. 30 s |
| Abkühlrate*) / Ramp-down rate*) $T_P$ to 100 °C | 3 K / s | 4 K / s maximum |
| Zeitspanne von 25 °C bis zur Spitzentemperatur / Time from 25 °C to peak temperature | | max. 8 min. |

Alle Temperaturen beziehen sich auf die Bauteilmitte, jeweils auf der Bauteiloberseite gemessen / All temperatures refer to the center of the package, measured on the top of the package
* Steigungsberechnung $\Delta T/\Delta t$: $\Delta t$ max. 5 s; erfüllt über den gesamten Temperaturbereich / slope calculation $\Delta T/\Delta t$: $\Delta t$ max. 5 s; fulfillment for the whole T-range

**Wellenlöten (TTW)** (nach CECC 00802)
**TTW Soldering** (acc. to CECC 00802)

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EU RoHS and China RoHS compliant product

此产品符合欧盟 RoHS 指令的要求；

按照中国的相关法规和标准，不含有毒有害物质或元素。

The information describes the type of component and shall not be considered as assured characteristics.
Terms of delivery and rights to change design reserved. Due to technical requirements components may contain dangerous substances. For information on the types in question please contact our Sales Organization.

**Packing**

Please use the recycling operators known to you. We can also help you – get in touch with your nearest sales office. By agreement we will take packing material back, if it is sorted. You must bear the costs of transport. For packing material that is returned to us unsorted or which we are not obliged to accept, we shall have to invoice you for any costs incurred.

**Components used in life-support devices or systems must be expressly authorized for such purpose!** Critical components [1] , may only be used in life-support devices or systems [2] with the express written approval of OSRAM OS.

[1] A critical component is a component usedin 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.