

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

SFH 4248  
SFH 4249



**Vorläufige Daten / Preliminary Data**  
**OS-PCN-2010-033-A. To be used for design-in.**

## Wesentliche Merkmale

- Infrarot LED mit hoher Ausgangsleistung
- Kurze Schaltzeiten
- Halbwinkel SFH 4248:  $\pm 15^\circ$
- Halbwinkel SFH 4249:  $\pm 25^\circ$
- Hohe Bestromung bei hohen Temperaturen möglich

## Anwendungen

- Infrarotbeleuchtung für Kameras
- IR-Datenübertragung
- Sensorik

## 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

- High Power Infrared LED
- Short switching times
- Half angle SFH 4248:  $\pm 15^\circ$
- Half angle SFH 4249:  $\pm 25^\circ$
- High forward current allowed at high temperature

## Applications

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

## 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 <sup>1)</sup> ( $I_F = 100 \text{ mA}$ , $t_p = 20 \text{ ms}$ ) Radiant Intensity Grouping <sup>1)</sup> $I_e \text{ (mW/sr)}$
SFH 4248	Q65110A7518	$\geq 40$ (typ. 100)
SFH 4249	Q65110A7519	$\geq 25$ (typ. 55)

<sup>1)</sup> 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 ... + 100	°C
Sperrspannung Reverse voltage	$V_R$	5	V
Vorwärtsgleichstrom Forward current	$I_F$	100	mA
Stoßstrom, $t_p = 100\ \mu\text{s}$ , $D = 0$ Surge current	$I_{FSM}$	1.5	A
Verlustleistung Power dissipation	$P_{tot}$	180	mW
Wärmewiderstand Sperrschicht - Umgebung bei Montage auf FR4 Platine, Padgröße je $16\ \text{mm}^2$ Thermal resistance junction - ambient mounted on PC-board (FR4), padsize $16\ \text{mm}^2$ each	$R_{thJA}$	300	K/W
Wärmewiderstand Sperrschicht - Lötstelle bei Montage auf Metall-Block Thermal resistance junction - soldering point, mounted on metal block	$R_{thJS}$	140	K/W

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

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Wellenlänge der Strahlung Wavelength at peak emission $I_F = 100\ \text{mA}$	$\lambda_{peak}$	950	nm
Centroid-Wellenlänge der Strahlung Centroid wavelength $I_F = 100\ \text{mA}$	$\lambda_{centroid}$	940	nm
Spektrale Bandbreite bei 50% von $I_{max}$ Spectral bandwidth at 50% of $I_{max}$ $I_F = 100\ \text{mA}$	$\Delta\lambda$	42	nm
Abstrahlwinkel Half angle SFH 4248 SFH 4249	$\varphi$ $\varphi$	$\pm 15$ $\pm 25$	Grad deg.

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

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Aktive Chipfläche Active chip area	$A$	0.09	mm <sup>2</sup>
Abmessungen der aktiven Chipfläche Dimension of the active chip area	$L \times B$ $L \times W$	$0.3 \times 0.3$	mm <sup>2</sup>
Schaltzeiten, $I_e$ von 10% auf 90% und von 90% auf 10%, bei $I_F = 100\text{ mA}$ , $R_L = 50\ \Omega$ Switching times, $I_e$ from 10% to 90% and from 90% to 10%, $I_F = 100\text{ mA}$ , $R_L = 50\ \Omega$	$t_r, t_f$	11	ns
Durchlassspannung Forward voltage $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$ $I_F = 1\text{ A}$ , $t_p = 100\ \mu\text{s}$	$V_F$ $V_F$	1.5 (< 1.8) 2.3 (< 3.0)	V V
Sperrstrom Reverse current	$I_R$	not designed for reverse operation	$\mu\text{A}$
Gesamtstrahlungsfluss Total radiant flux $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$	$\Phi_e$	50	mW
Temperaturkoeffizient von $I_e$ bzw. $\Phi_e$ , $I_F = 100\text{ mA}$ Temperature coefficient of $I_e$ or $\Phi_e$ , $I_F = 100\text{ mA}$	$TC_I$	- 0.5	%/K
Temperaturkoeffizient von $V_F$ , $I_F = 100\text{ mA}$ Temperature coefficient of $V_F$ , $I_F = 100\text{ mA}$	$TC_V$	- 3	mV/K
Temperaturkoeffizient von $\lambda$ , $I_F = 100\text{ mA}$ Temperature coefficient of $\lambda$ , $I_F = 100\text{ mA}$	$TC_\lambda$	+ 0.3	nm/K

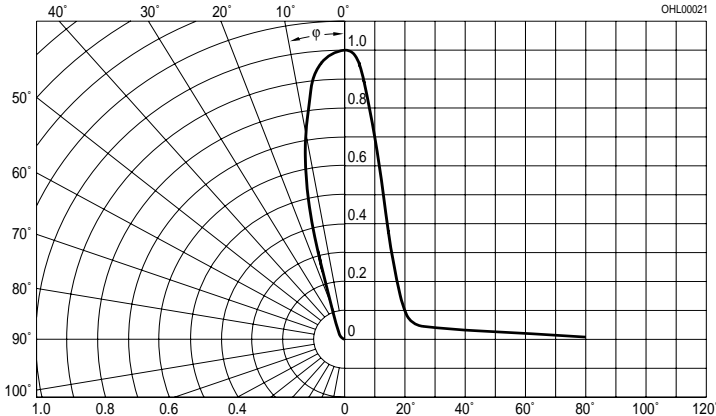
**Strahlstärke  $I_e$  in Achsrichtung<sup>1)</sup>**gemessen bei einem Raumwinkel  $\Omega = 0.01$  sr**Radiant Intensity  $I_e$  in Axial Direction**at a solid angle of  $\Omega = 0.01$  sr

Bezeichnung Parameter	Symbol	Werte Values			Einheit Unit
		SFH 4248	SFH 4248	SFH 4248	
		-U	-V	-AW	
Strahlstärke Radiant intensity $I_F = 100$ mA, $t_p = 20$ ms	$I_{e \text{ min}}$	40	63	100	mW/sr
	$I_{e \text{ max}}$	80	125	200	mW/sr
Strahlstärke Radiant intensity $I_F = 1$ A, $t_p = 25$ $\mu$ s	$I_{e \text{ typ.}}$	420	660	1050	mW/sr
		SFH 4249	SFH 4249	SFH 4249	
		-T	-U	-V	
Strahlstärke Radiant intensity $I_F = 100$ mA, $t_p = 20$ ms	$I_{e \text{ min}}$	25	40	63	mW/sr
	$I_{e \text{ max}}$	50	80	125	mW/sr
Strahlstärke Radiant intensity $I_F = 1$ A, $t_p = 25$ $\mu$ s	$I_{e \text{ typ.}}$	260	420	660	mW/sr

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

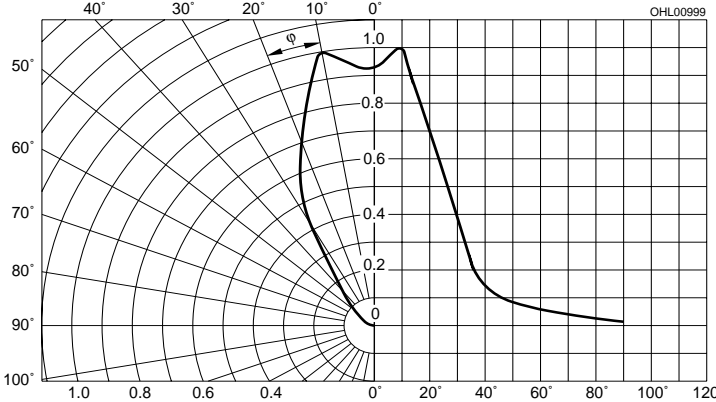
**Abstrahlcharakteristik**  
**Radiation Characteristics  $I_{rel} = f(\varphi)$**

SFH 4248



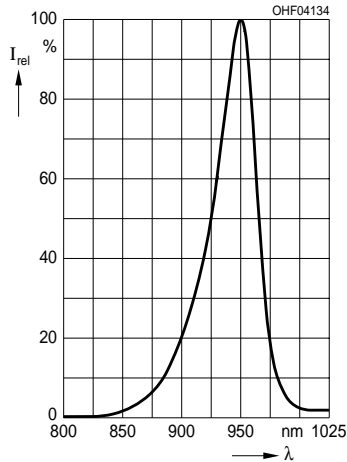
**Abstrahlcharakteristik**  
**Radiation Characteristics  $I_{rel} = f(\varphi)$**

SFH 4249



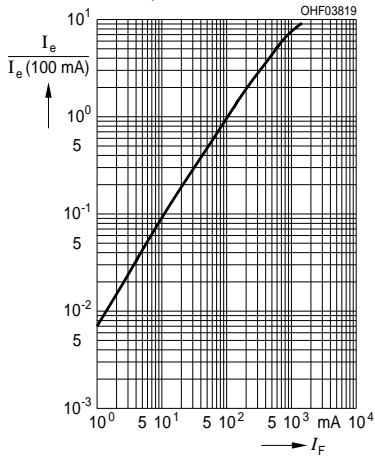
**Relative Spectral Emission**

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



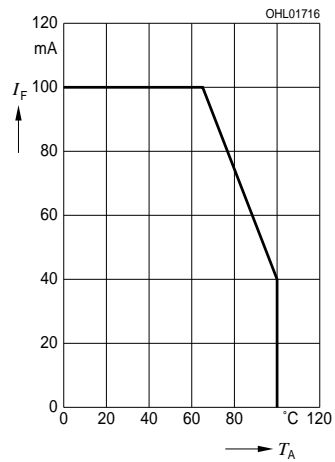
**Radiant Intensity**  $\frac{I_e}{I_e 100 \text{ mA}} = f(I_F)$

Single pulse,  $t_p = 25 \mu\text{s}$



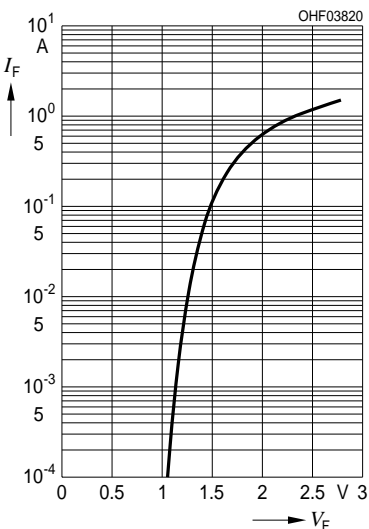
**Max. Permissible Forward Current**

$I_F = f(T_A), R_{thJA} = 300 \text{ K/W}$



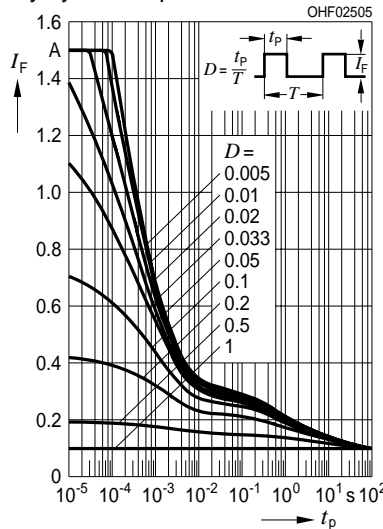
**Forward Current**  $I_F = f(V_F)$

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

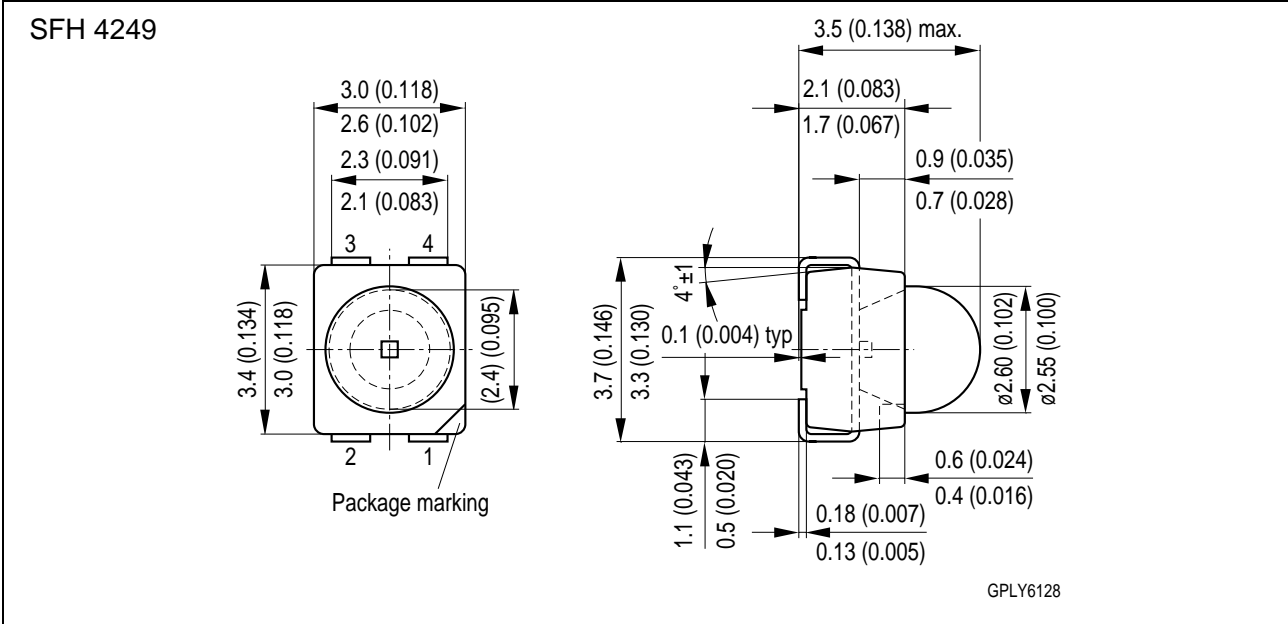
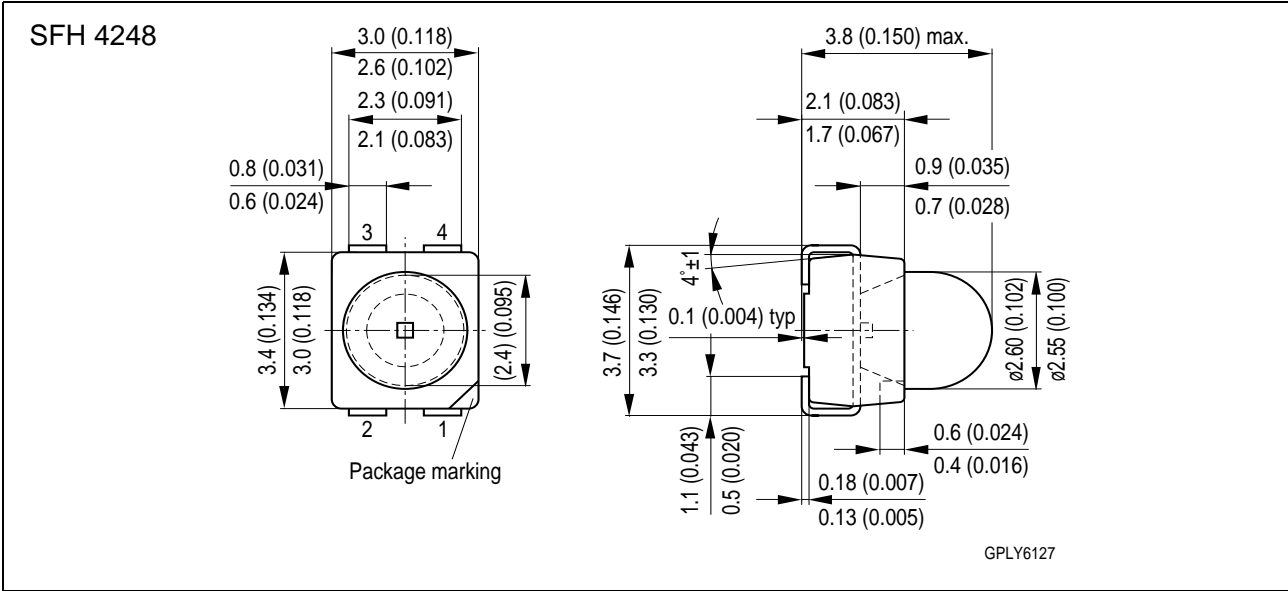


**Permissible Pulse Handling Capability**

$I_F = f(\tau), T_A = 25 \text{ °C}$ ,  
duty cycle  $D = \text{parameter}$



**Maßzeichnung  
Package Outlines**



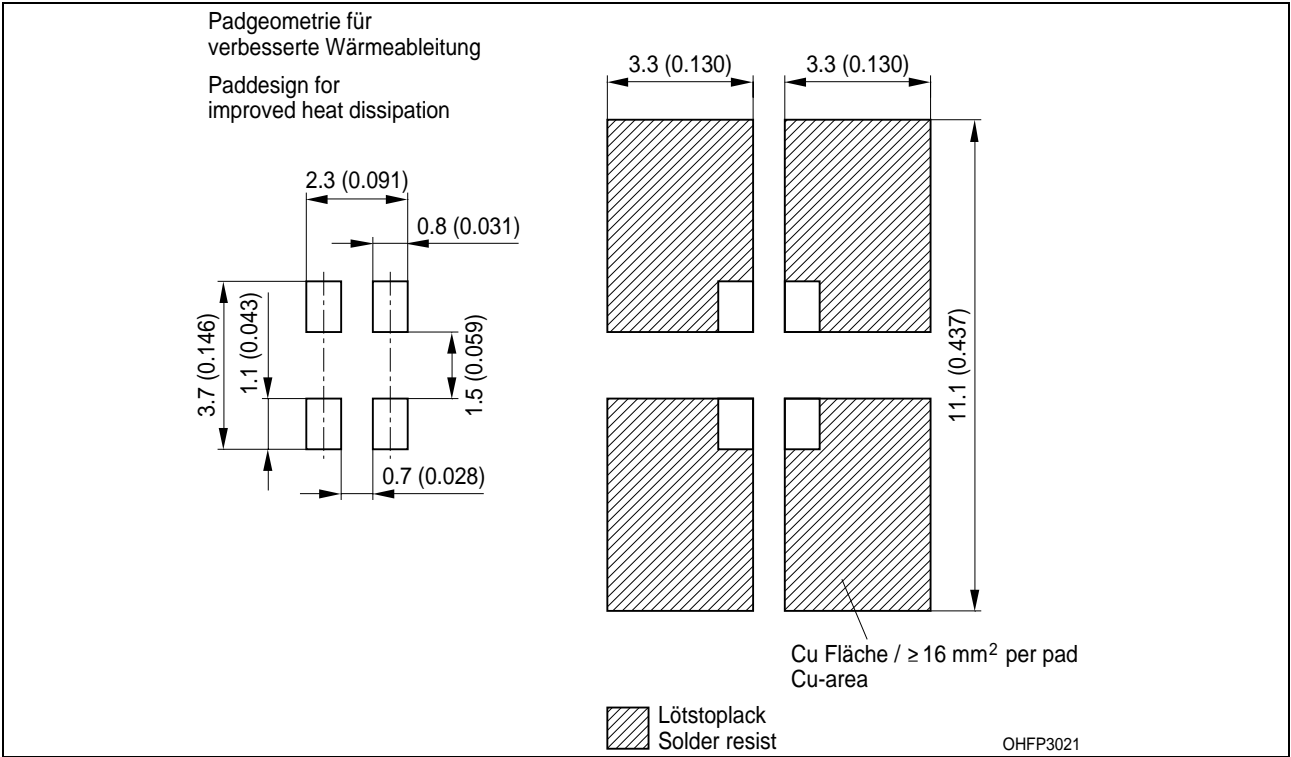
Maße in mm (inch) / Dimensions in mm (inch).

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

Downloaded from [Elcodis.com](http://Elcodis.com) electronic components distributor

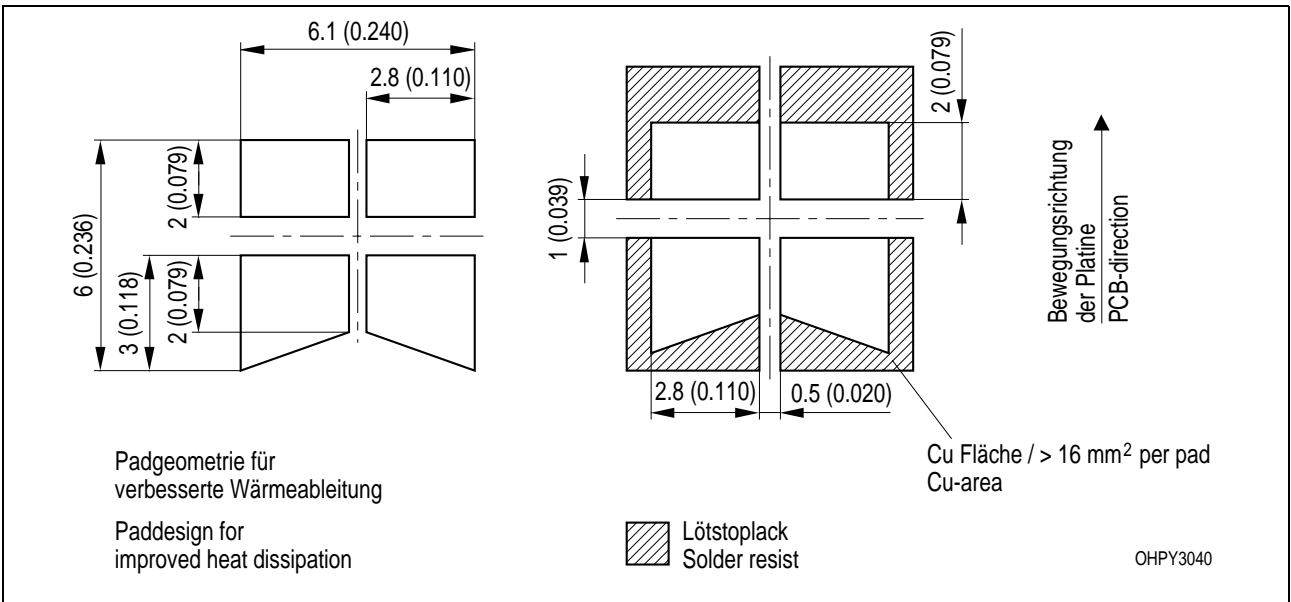
**Empfohlenes Lötpad-Design**  
**Recommended Solder Pad Design**

**Reflow Löten**  
**Reflow Soldering**



**Empfohlenes Lötpad-Design**  
**Recommended Solder Pad Design**

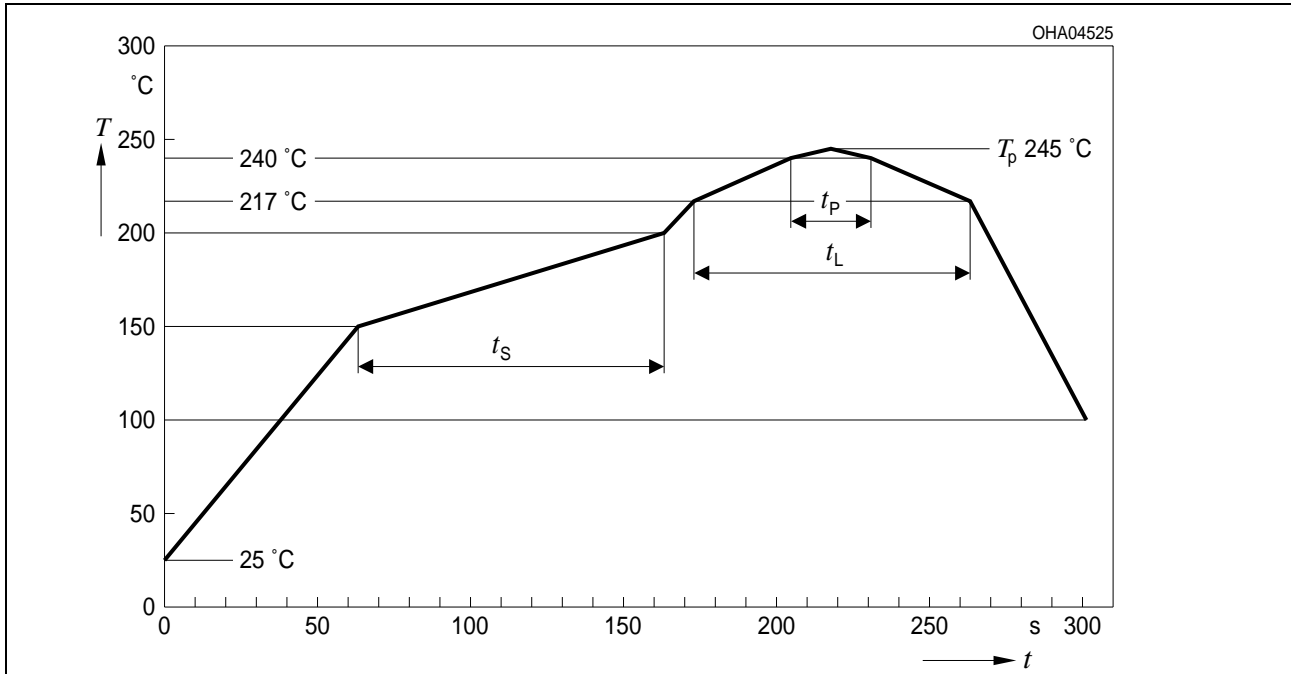
**Wellenlöten TTW**  
**TTW Soldering**





**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-020-D.01)  
 (acc. to J-STD-020-D.01)

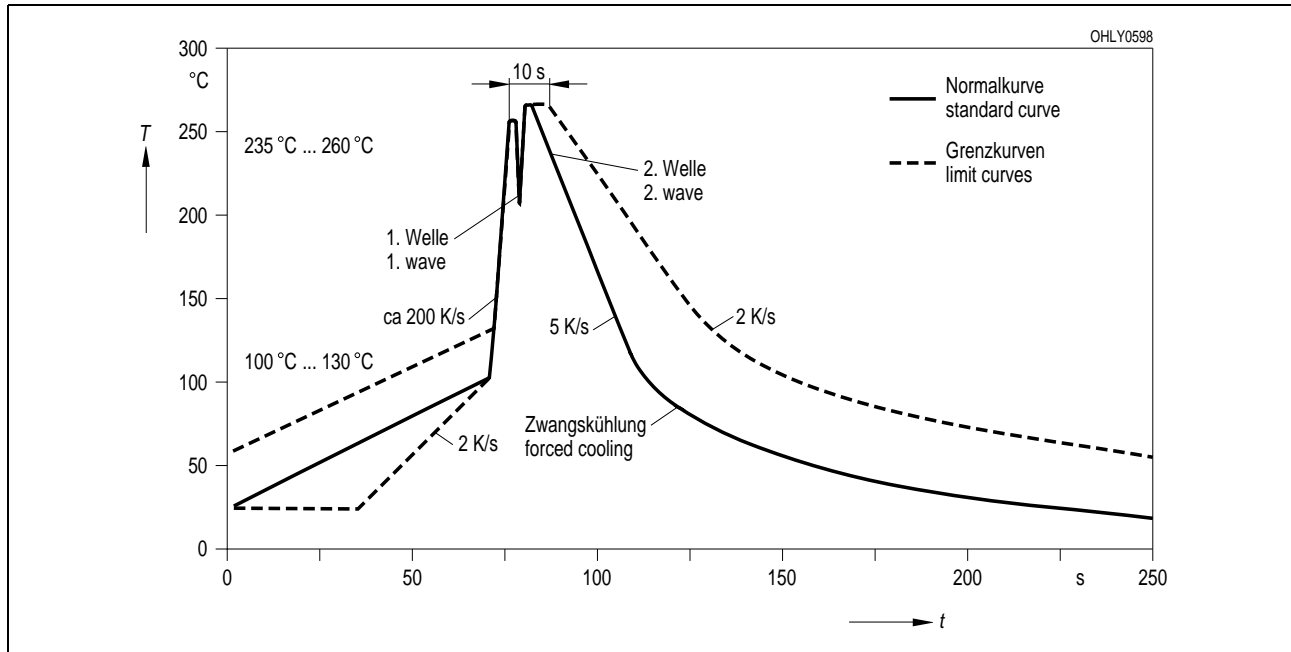


Pb-Free (SnAgCu) Assembly		
Profile Feature	Recommendation	Max. Ratings
Ramp-up Rate to Preheat*) 25°C to 150°C	2°K / sec	3°K / sec
Time $t_s$ from $T_{Smin}$ to $T_{Smax}$ (150°C to 200°C)	100s	min. 60sec max. 120sec
Ramp-up Rate to Peak*) $T_{Smax}$ to $T_p$	2°K / sec	3°K / sec
Liquidus Temperature $T_L$	217°C	
Time $t_L$ above $T_L$	80sec	max. 100sec
Peak Temperature $T_p$	245°C	max. 250°C
Time $t_p$ within 5°C of the specified peak temperature $T_p - 5K$	20sec	min. 10sec max. 30sec
Ramp-down Rate* $T_p$ to 100°C	3°K / sec	4°K / sec maximum
Time 25°C to Peak temperature		max. 8 min.

All temperatures refer to the center of the package, measured on the top of the component  
 \* slope calculation  $\Delta T/\Delta t$ :  $\Delta t$  max. 5 sec; fulfillment for the whole T-range

## Wellenlöten (TTW) TTW Soldering

(nach CECC 00802)  
(acc. to CECC 00802)



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