

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

**SFH 4258**  
**SFH 4259**



**Wesentliche Merkmale**

- Infrarot LED mit hoher Ausgangsleistung
- Emissionswellenlänge typ. 850 nm
- Halbwinkel SFH 4258:  $\pm 15^\circ$
- Halbwinkel SFH 4259:  $\pm 25^\circ$
- Hohe Bestromung bei hohen Temperaturen möglich

**Anwendungen**

- Infrarotbeleuchtung für CMOS 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
- Peak wavelength typ. 850 nm
- Half angle SFH 4258:  $\pm 15^\circ$
- Half angle SFH 4259:  $\pm 25^\circ$
- High forward current allowed at high temperature

**Applications**

- Infrared Illumination for CMOS 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> $I_e$ (mW/sr)
SFH 4258	Q65110A2975	$\geq 40$ (typ. 90)
SFH 4259	Q65110A2464	$\geq 25$ (typ. 55)

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



**ATTENTION - Observe Precautions For Handling - Electrostatic Sensitive Device**

**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), pads size $16\ \text{mm}^2$ 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 $I_F = 100\ \text{mA}$	$\lambda_{peak}$	850	nm
Spektrale Bandbreite bei 50% von $I_{max}$ Spectral bandwidth at 50% of $I_{max}$ $I_F = 100\ \text{mA}$	$\Delta\lambda$	35	nm
Abstrahlwinkel Half angle SFH 4258 SFH 4259	$\varphi$ $\varphi$	$\pm 15$ $\pm 25$	Grad deg.
Aktive Chipfläche Active chip area	$A$	0.09	$\text{mm}^2$

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

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
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%, $I_F = 100\text{ mA}$ , $R_L = 50\ \Omega$	$t_r, t_f$	12	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) 2.4 (< 3.0)	V V
Sperrstrom Reverse current $V_R = 5\text{ V}$	$I_R$	not designed for reverse operation	$\mu\text{A}$
Gesamtstrahlungsfluss Total radiant flux $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$	$\Phi_{e\text{ typ}}$	45	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 $V_F$ , $I_F = 100\text{ mA}$	$TC_V$	- 0.7	mV/K
Temperaturkoeffizient von $\lambda$ , $I_F = 100\text{ mA}$ Temperature coefficient of $\lambda$ , $I_F = 100\text{ mA}$	$TC_\lambda$	+ 0.2	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

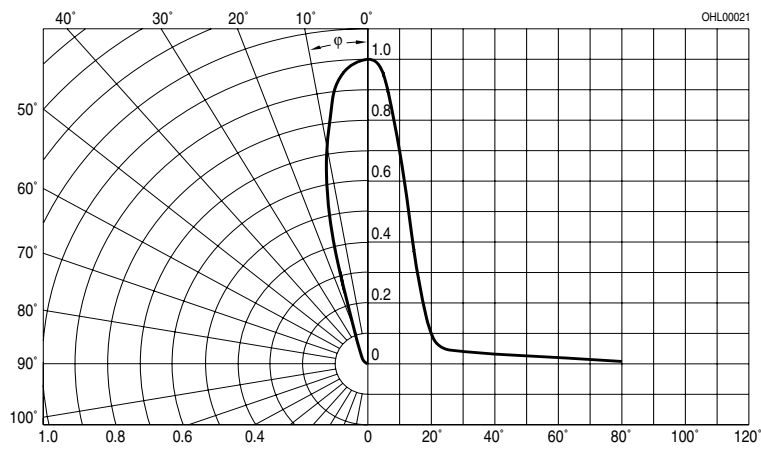
Bezeichnung Parameter	Symbol	Werte Values			Einheit Unit
		SFH 4258 -U	SFH 4258 -V	SFH 4258 -AW	
Strahlstärke Radiant intensity $I_F = 100$ mA, $t_p = 20$ ms	$I_{e \text{ min}}$ $I_{e \text{ max}}$	40 80	63 125	100 200	mW/sr mW/sr
Strahlstärke Radiant intensity $I_F = 1$ A, $t_p = 100$ $\mu$ s	$I_{e \text{ typ.}}$	400	600	800	mW/sr
		SFH 4259 -T	SFH 4259 -U		
Strahlstärke Radiant intensity $I_F = 100$ mA, $t_p = 20$ ms	$I_{e \text{ min}}$ $I_{e \text{ max}}$	25 50	40 80		mW/sr mW/sr
Strahlstärke Radiant intensity $I_F = 1$ A, $t_p = 100$ $\mu$ s	$I_{e \text{ typ.}}$	250	350		mW/sr

<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**  $I_{rel} = f(\varphi)$

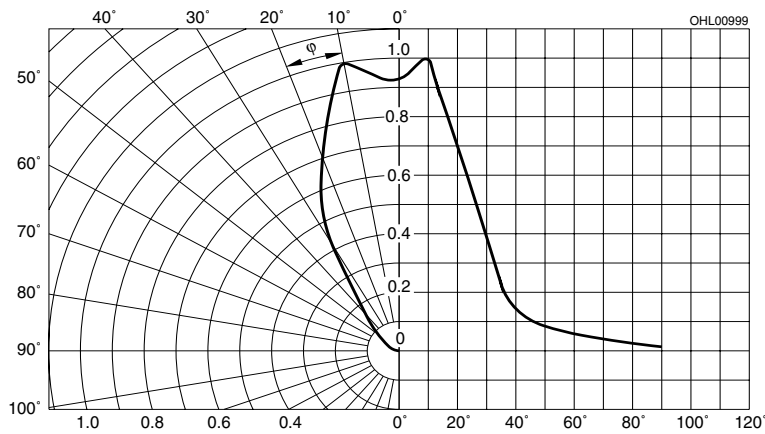
SFH 4258



**Abstrahlcharakteristik**

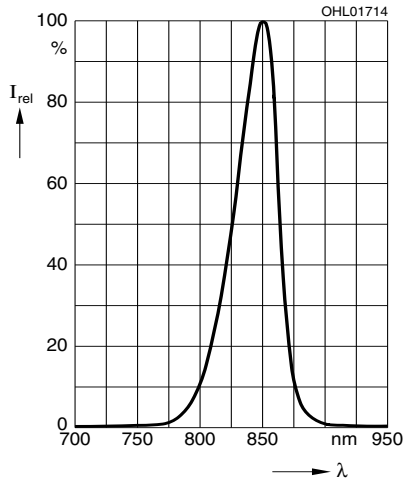
**Radiation Characteristics**  $I_{rel} = f(\varphi)$

SFH 4259



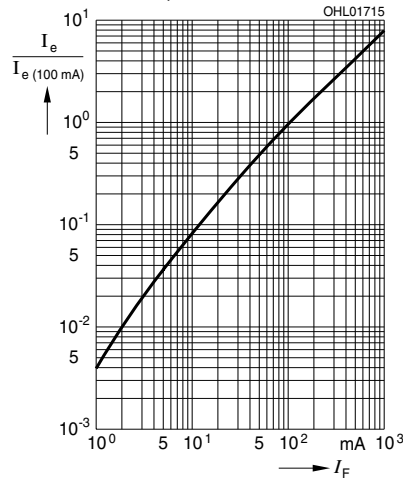
**Relative Spectral Emission**

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



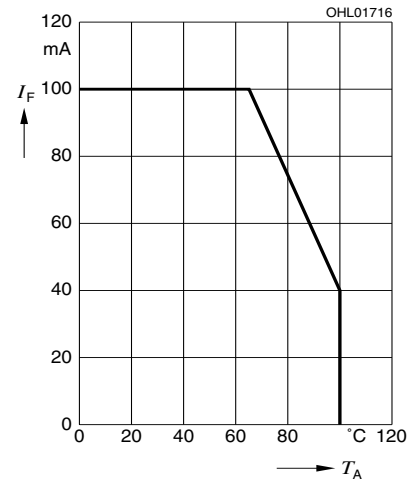
**Radiant Intensity**  $\frac{I_e}{I_e 100 \text{ mA}} = f(I_F)$

Single pulse,  $t_p = 20 \mu\text{s}$



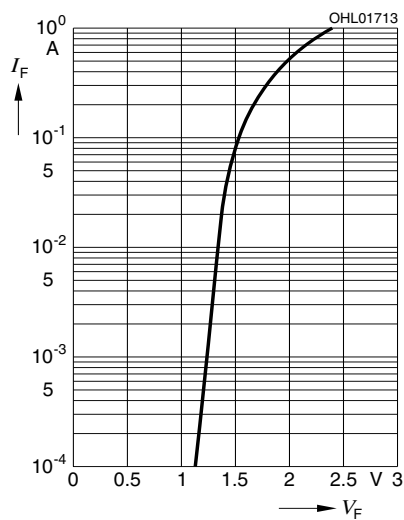
**Max. Permissible Forward Current**

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



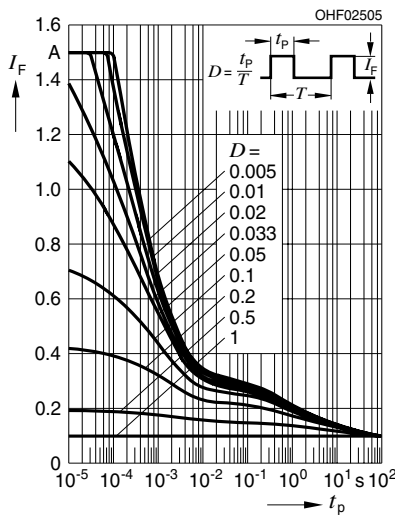
**Forward Current**  $I_F = f(V_F)$

Single pulse,  $t_p = 20 \mu\text{s}$

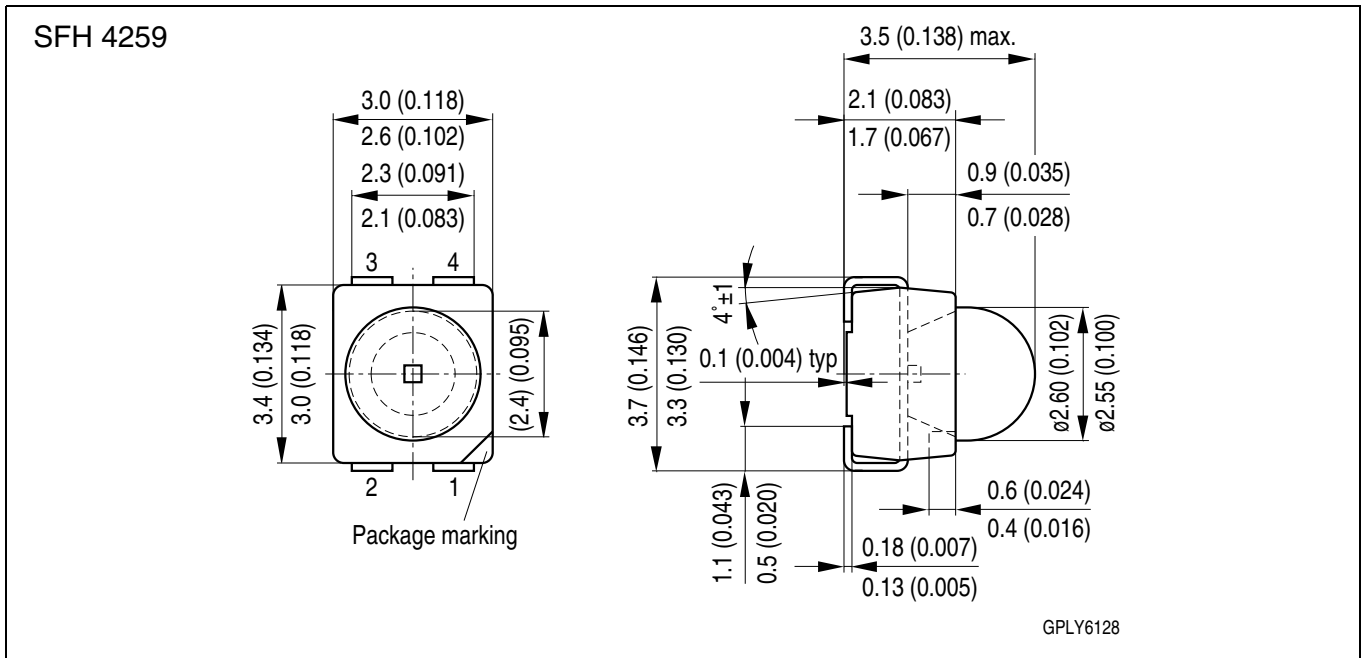
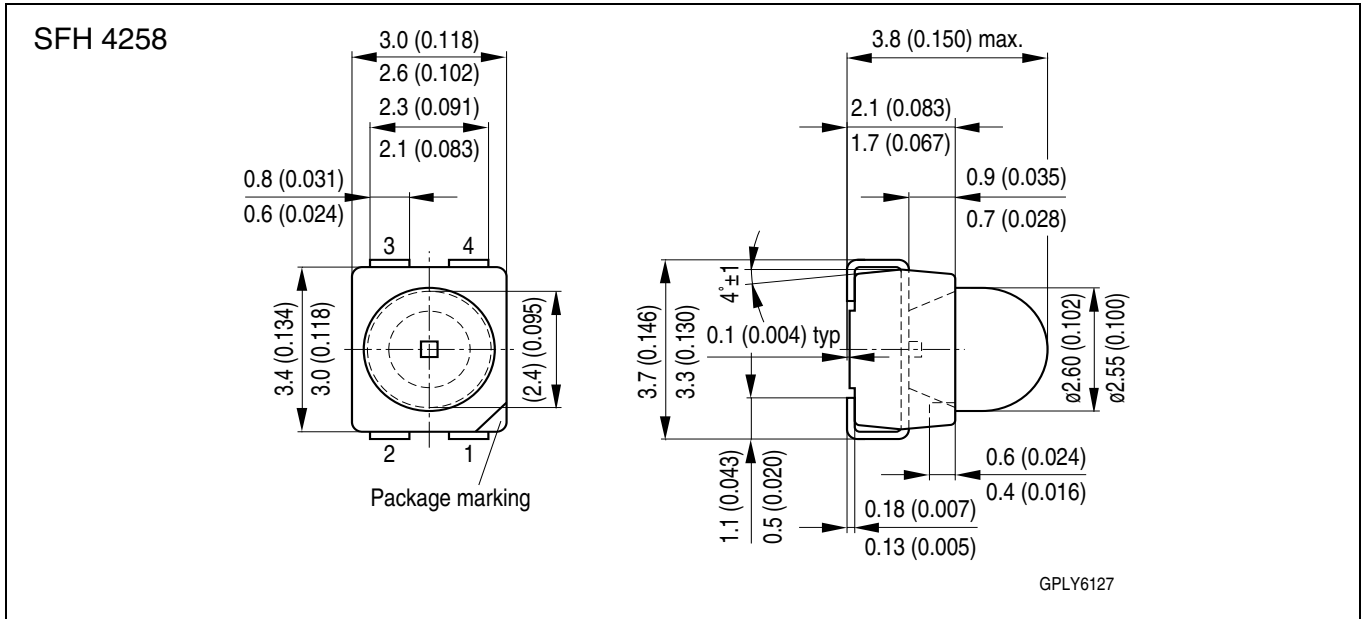


**Permissible Pulse Handling Capability**

$I_F = f(\tau), T_A \leq 65 \text{ °C}$ ,  
duty cycle  $D = \text{parameter}$



**Maßzeichnung  
Package Outlines**

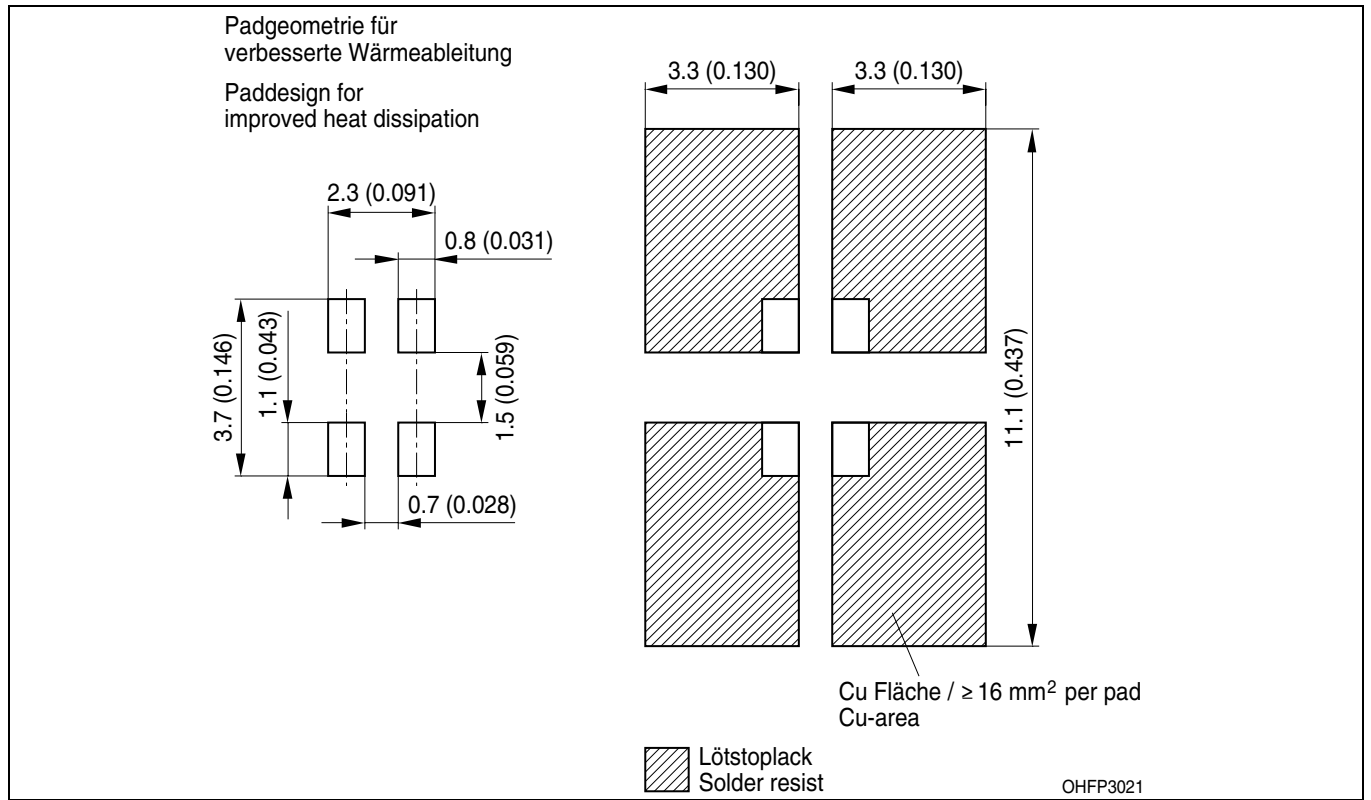


Maße in mm (inch) / Dimensions in mm (inch).

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

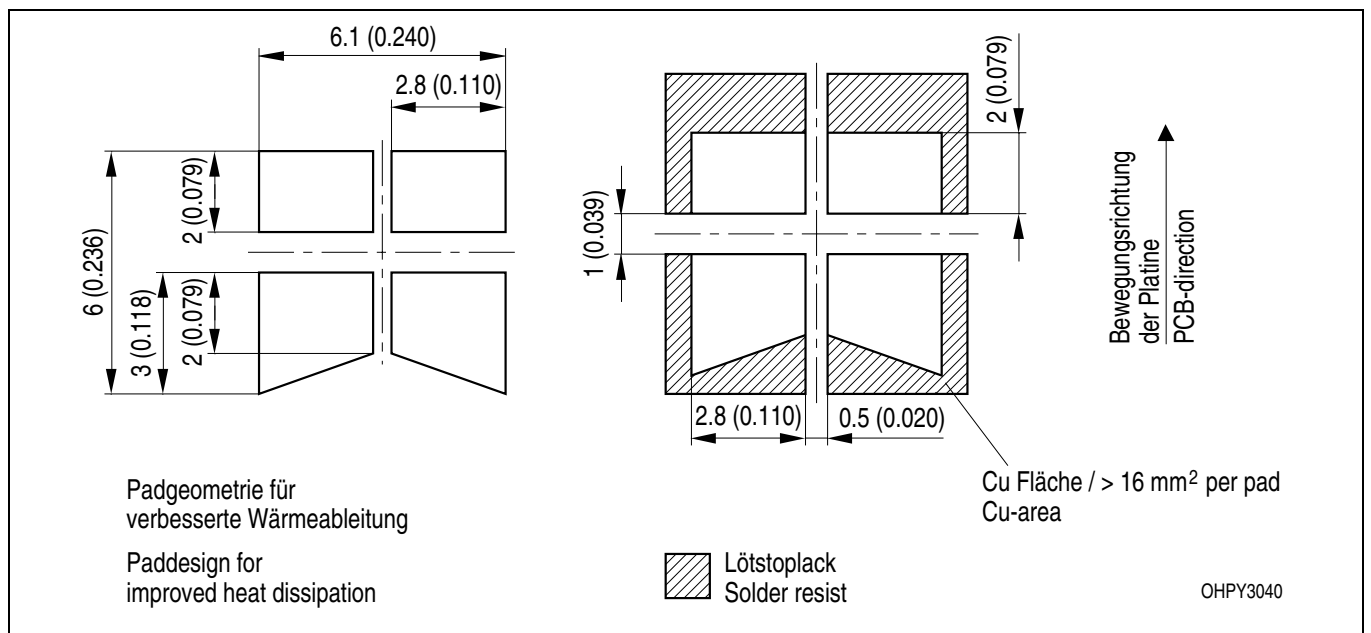
**Empfohlenes Lötpaddesign**  
**Recommended Solder Pad Design**

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



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

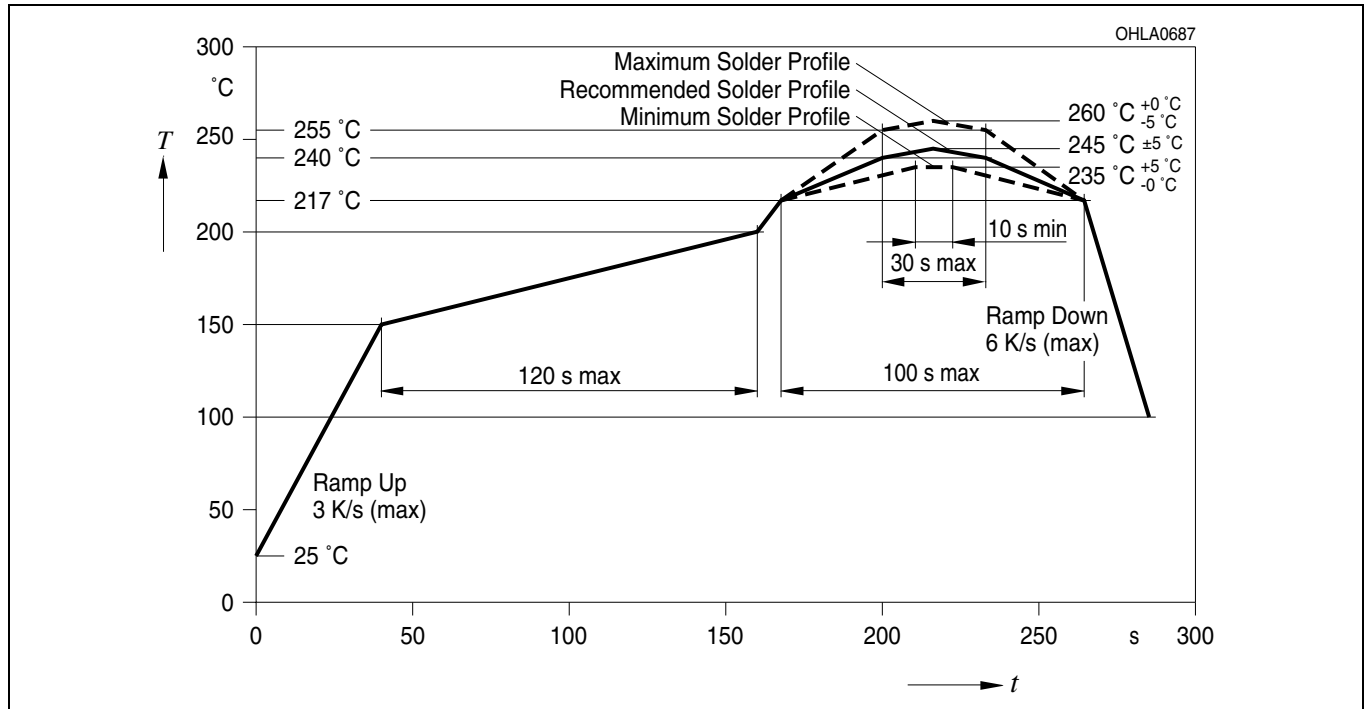
**Wellenlöten TTW**  
**TTW Soldering**





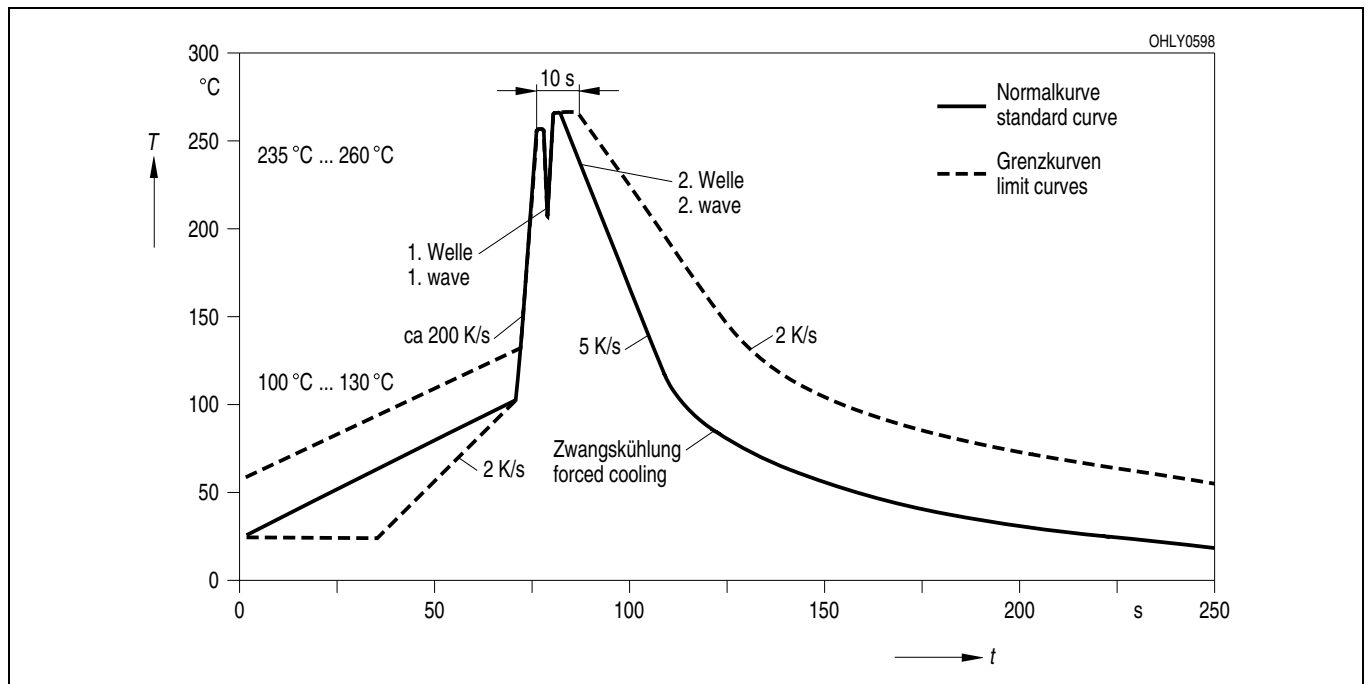
**Lötbedingungen**  
**Soldering Conditions**  
**Reflow Lötprofil für bleifreies Löten**  
**Reflow Soldering Profile for lead free soldering**

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



**Wellenlöten (TTW)**  
**TTW Soldering**

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



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<sup>1</sup> 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.

<sup>2</sup> 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.