

**Infrarot-LED**  
**Infrared-LED**  
**Lead (Pb) Free Product - RoHS Compliant**

**SFH 4281**



**Wesentliche Merkmale**

- Emissionswellenlänge 880 nm
- Homogene Abstrahlcharakteristik

**Anwendungen**

- Miniaturlichtschranken für Gleich- und Wechsellichtbetrieb
- Industrieelektronik
- „Messen/Steuern/Regeln“
- Automobiltechnik
- Sensorik
- Alarm- und Sicherungssysteme

**Features**

- Typical peak wavelength 880 nm
- Homogeneous Radiation Pattern

**Applications**

- Miniature photointerrupters
- Industrial electronics
- For drive and control circuits
- Automotive technology
- Sensor technology
- Alarm and safety equipment

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)	
		-P	-Q
SFH 4281	Q65110A2516	4 ... 8	6.3 ... 12.5

<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
Durchlassstrom Forward current	$I_F$	100	mA
Stoßstrom, $\tau = 10\ \mu\text{s}$ , $D = 0$ Surge current	$I_{FSM}$	2.5	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	$R_{thJA}$	450	K/W
Wärmewiderstand Sperrschicht - Lötstelle bei Montage auf Metall-Block Thermal resistance junction - soldering point, mounted on metal block	$R_{thJC}$	$\approx 200$	K/W

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

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Wellenlänge der Strahlung Wavelength at peak emission $I_F = 100\ \text{mA}$ , $t_p = 20\ \text{ms}$	$\lambda_{peak}$	880	nm
Spektrale Bandbreite bei 50% von $I_{max}$ Spectral bandwidth at 50% of $I_{max}$ $I_F = 100\ \text{mA}$	$\Delta\lambda$	80	nm
Abstrahlwinkel Half angle	$\varphi$	$\pm 60$	Grad deg.
Aktive Chipfläche Active chip area	$A$	0.09	$\text{mm}^2$
Abmessungen der aktiven Chipfläche Dimension of the active chip area	$L \times B$ $L \times W$	$0.3 \times 0.3$	mm

Kennwerte ( $T_A = 25\text{ °C}$ )

Characteristics (cont'd)

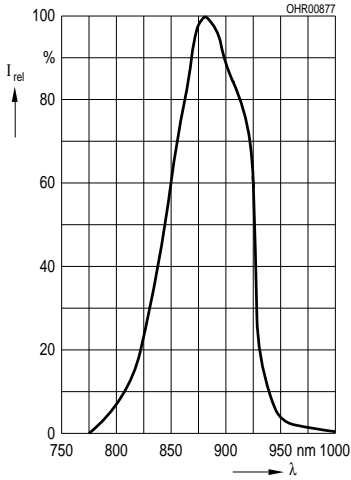
Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Schaltzeiten, $I_e$ von 10% auf 90% und von 90% auf 10%, bei $I_F = 100\text{ mA}$ , $R_L = 50\ \Omega$ Switching times, $I_e$ from 10% to 90% and from 90% to 10%, $I_F = 100\text{ mA}$ , $R_L = 50\ \Omega$	$t_r, t_f$	0.5	$\mu\text{s}$
Kapazität Capacitance $V_R = 0\text{ V}$ , $f = 1\text{ MHz}$	$C_o$	15	pF
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 ( $\leq 1.8$ ) 3.0 ( $\leq 3.8$ )	V V
Sperrstrom Reverse current $V_R = 5\text{ V}$	$I_R$	0.01 ( $\leq 1$ )	$\mu\text{A}$
Gesamtstrahlungsfluss Total radiant flux $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$	$\Phi_e$	23	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 $V_F$ , $I_F = 100\text{ mA}$	$TC_V$	- 2	mV/K
Temperaturkoeffizient von $\lambda$ , $I_F = 100\text{ mA}$ Temperature coefficient of $\lambda$ , $I_F = 100\text{ mA}$	$TC_\lambda$	+ 0.25	nm/K

**Strahlstärke  $I_e$  in Achsrichtung**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
		-P	-Q	
Strahlstärke Radiant intensity $I_F = 100$ mA, $t_p = 20$ ms	$I_{e \text{ min}}$ $I_{e \text{ max}}$	4 8	6.3 12.5	mW/sr mW/sr
Strahlstärke Radiant intensity $I_F = 1$ A, $t_p = 100$ $\mu$ s	$I_{e \text{ typ.}}$	50	60	mW/sr

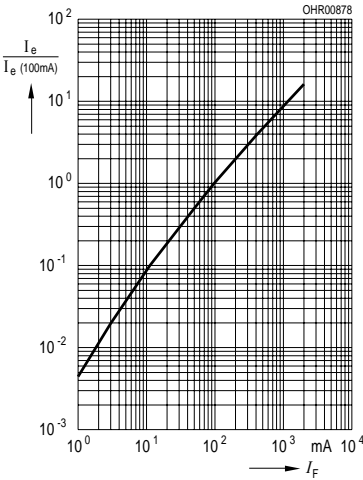
**Relative Spectral Emission**

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



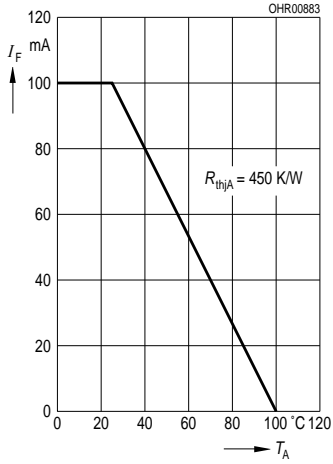
**Radiant Intensity**  $\frac{I_e}{I_e 100 \text{ mA}} = f(I_F)$

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



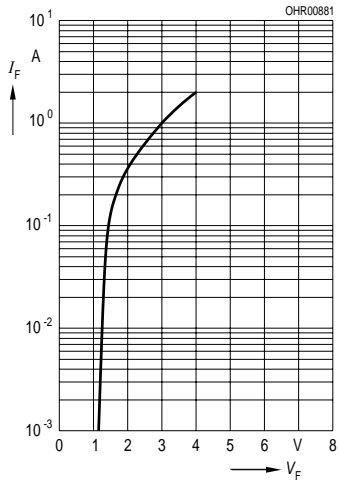
**Max. Permissible Forward Current**

$I_F = f(T_A)$



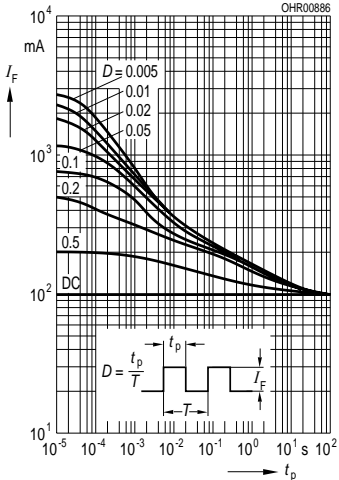
**Forward Current**

$I_F = f(V_F)$ , single pulse,  $t_p = 20 \mu\text{s}$



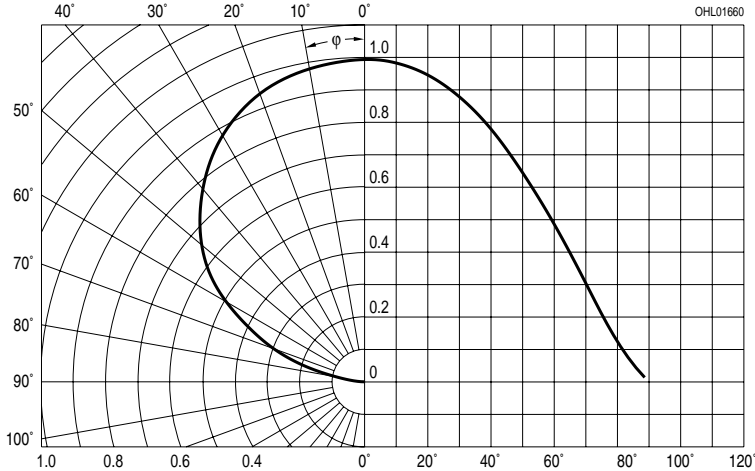
**Permissible Pulse Handling Capability**

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

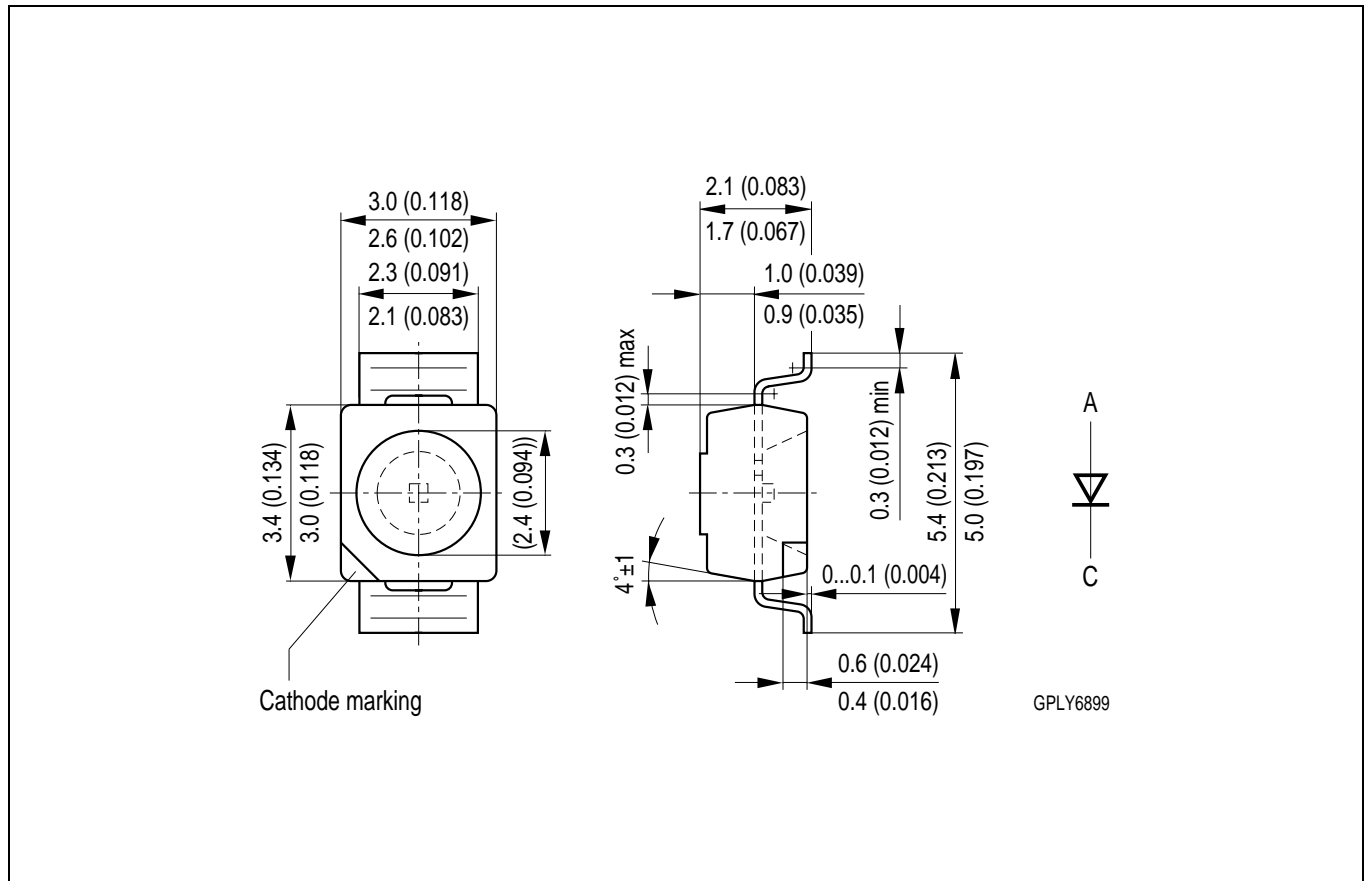


**Radiation Characteristics**

$S_{rel} = f(\varphi)$



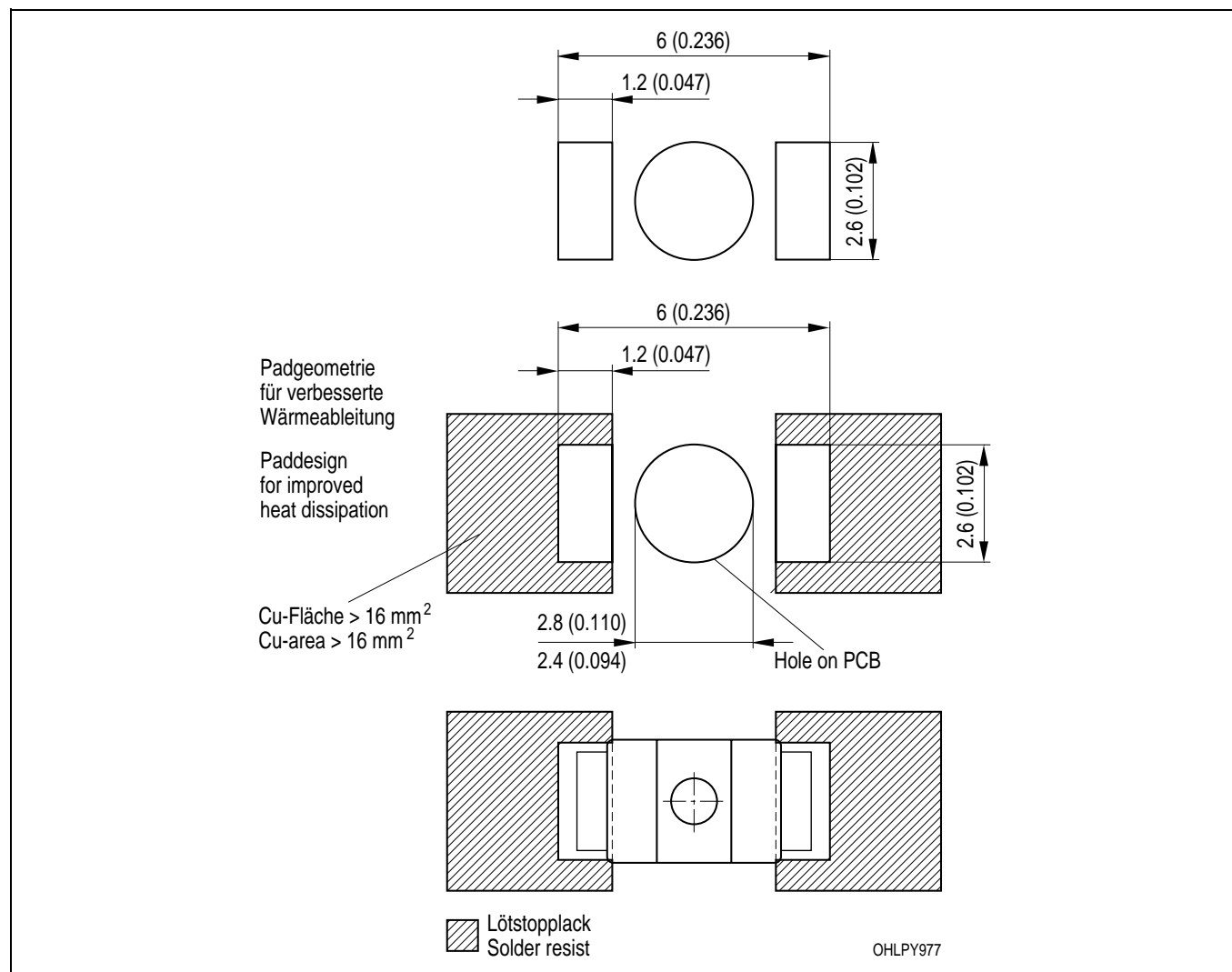
Maßzeichnung  
Package Outlines



Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

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

**IR-Reflow Löten**  
**IR Reflow Soldering**



Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

**Lötbedingungen**

**Soldering Conditions**

**IR-Reflow Lötprofil für bleifreies Löt**

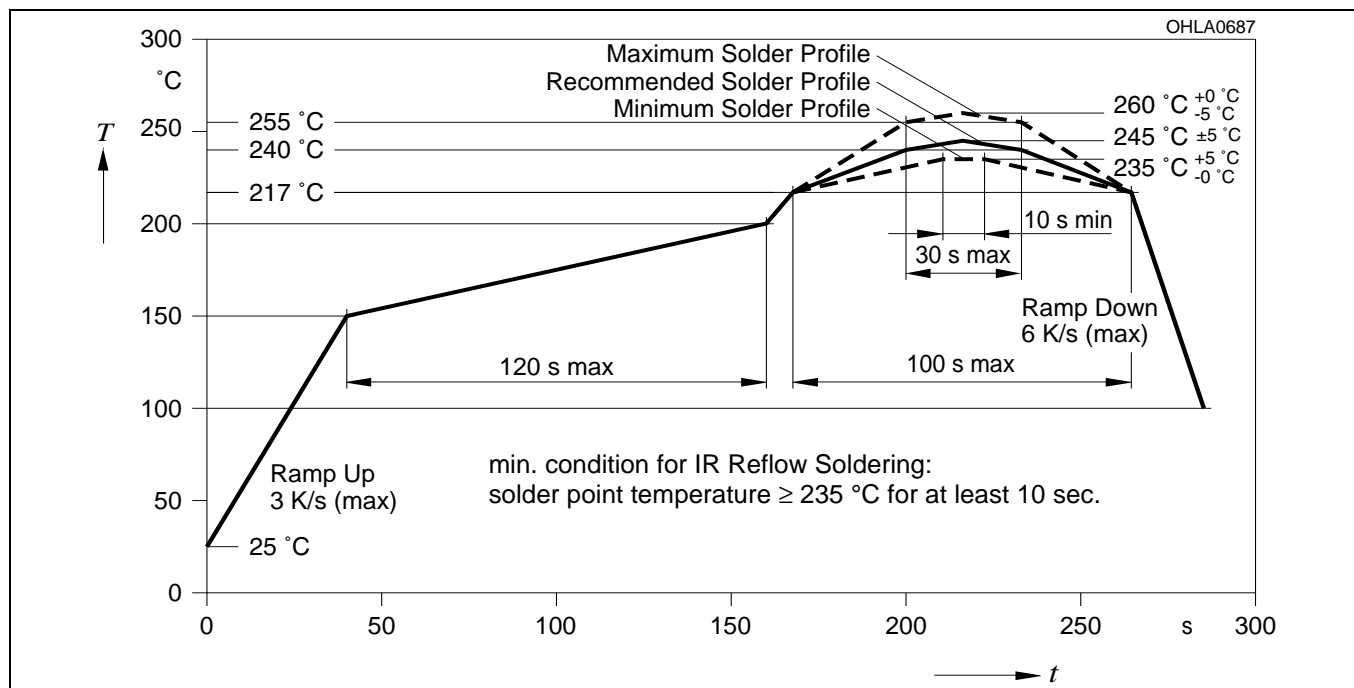
**IR Reflow Soldering Profile for lead free soldering**

Vorbehandlung nach JEDEC Level 2

Preconditioning acc. to JEDEC Level 2

(nach J-STD-020B)

(acc. to J-STD-020B)

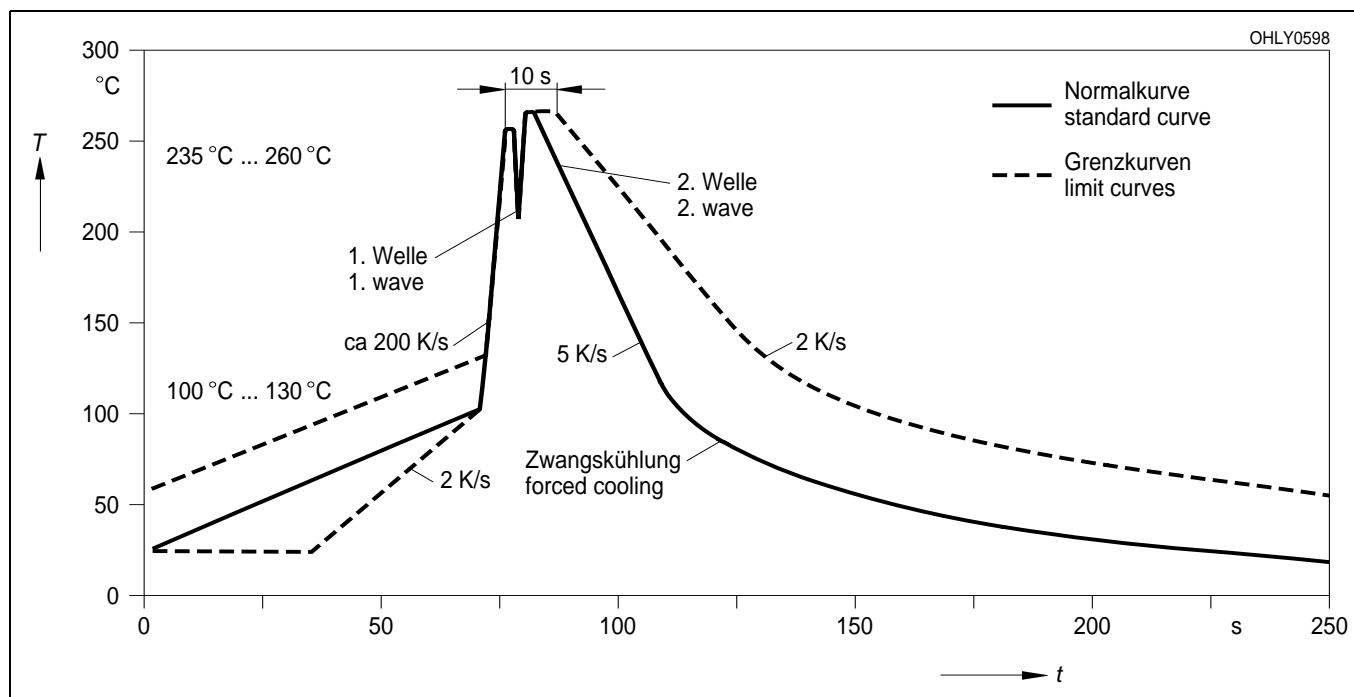


**Wellenlöt (TTW)**

(nach CECC 00802)

**TTW Soldering**

(acc. to CECC 00802)





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