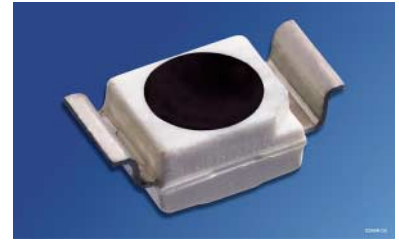


NPN-Silizium-Fototransistor in SMT TOPLED® RG-Gehäuse
Silicon NPN Phototransistor in SMT TOPLED® RG-Package
Lead (Pb) Free Product - RoHS Compliant

SFH 3211 FA



SFH 3211 FA

Wesentliche Merkmale

- Speziell geeignet für Anwendungen im Bereich von 750 nm bis 1120 nm
- Hohe Linearität
- Gruppiert lieferbar

Features

- Especially suitable for applications from 750 nm to 1120 nm
- High linearity
- Available in groups

Anwendungen

- Miniaturlichtschranken
- Industrieelektronik
- „Messen/Steuern/Regeln“

Applications

- Miniature photointerrupters
- Industrial electronics
- For control and drive circuits

Typ Type	Bestellnummer Ordering Code	Fotostrom , ($E_e=0,1\text{mW/cm}^2$, $\lambda=950\text{nm}$ $V_{CE} = 5\text{ V}$) Photocurrent I_{pce} (μA)
SFH 3211 FA	Q65110A2526	≥ 16
SFH 3211 FA-3/-4	Q65110A2528	25-80

Grenzwerte
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
Kollektor-Emitterspannung Collector-emitter voltage	V_{CE}	35	V
Kollektorstrom Collector current	I_C	15	mA
Kollektorspitzenstrom, $\tau < 10 \mu s$ Collector surge current	I_{CS}	75	mA
Verlustleistung, $T_A = 25 \text{ °C}$ Total power dissipation	P_{tot}	165	mW
Wärmewiderstand für Montage auf PC-Board Thermal resistance for mounting on pcb	R_{thJA}	450	K/W

Kennwerte ($T_A = 25\text{ °C}$, $\lambda = 950\text{ nm}$)

Characteristics

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Wellenlänge der max. Fotoempfindlichkeit Wavelength of max. sensitivity	$\lambda_{S\text{ max}}$	980	nm
Spektraler Bereich der Fotoempfindlichkeit $S = 10\%$ von S_{max} Spectral range of sensitivity $S = 10\%$ of S_{max}	λ	750 ... 1120	nm
Bestrahlungsempfindliche Fläche ($\varnothing 240\text{ }\mu\text{m}$) Radiant sensitive area	A	0.045	mm^2
Abmessung der Chipfläche Dimensions of chip area	$L \times B$ $L \times W$	0.45×0.45	$\text{mm} \times \text{mm}$
Halbwinkel Half angle	φ	± 60	Grad deg.
Kapazität, $V_{\text{CE}} = 0\text{ V}$, $f = 1\text{ MHz}$, $E = 0$ Capacitance	C_{CE}	5.0	pF
Dunkelstrom Dark current $V_{\text{CE}} = 25\text{ V}$, $E = 0$	I_{CEO}	1 (≤ 200)	nA

Die Fototransistoren werden nach ihrer Fotoempfindlichkeit gruppiert und mit arabischen Ziffern gekennzeichnet.

The phototransistors are grouped according to their spectral sensitivity and distinguished by arabian figures.

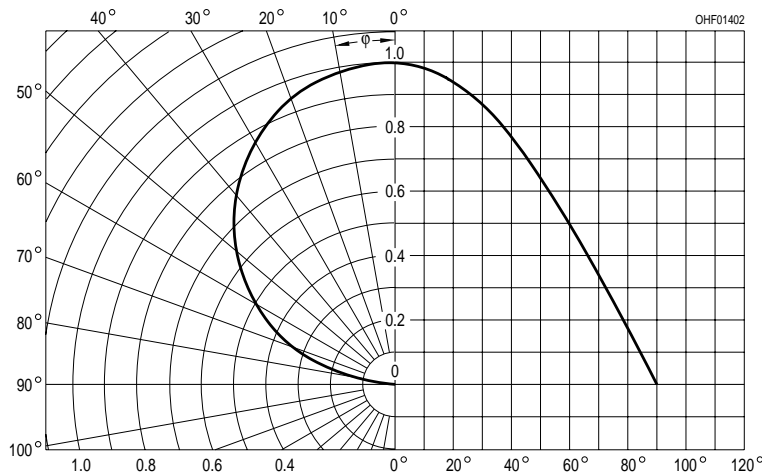
Bezeichnung Parameter	Symbol Symbol	Wert Value				Einheit Unit
		SFH 3211FA	-2	-3	-4	
Fotostrom Photocurrent $E_e = 0.1 \text{ mW/cm}^2, \lambda = 950 \text{ nm}, V_{CE} = 5 \text{ V}$	I_{PCE}	≥ 16	16 ... 32	25 ... 50	40 ... 80	μA
Anstiegszeit/Abfallzeit Rise and fall time $I_C = 1 \text{ mA}, V_{CC} = 5 \text{ V}, R_L = 1 \text{ k}\Omega$	t_r, t_f	7	6	7	8	μs
Kollektor-Emitter-Sättigungsspannung Collector-emitter saturation voltage $I_C = I_{PCEmin}^{1)} \times 0.3,$ $E_e = 0.1 \text{ mW/cm}^2$	V_{CEsat}	150	150	150	150	mV

1) I_{PCEmin} ist der minimale Fotostrom der jeweiligen Gruppe.

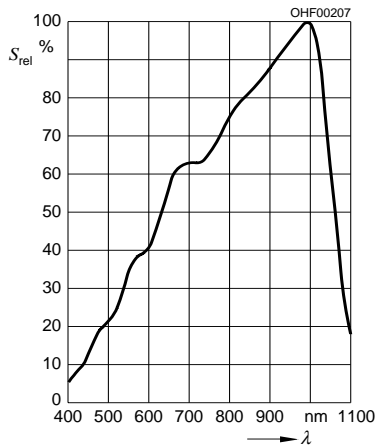
1) I_{PCEmin} is the min. photocurrent of the specified group.

Directional Characteristics

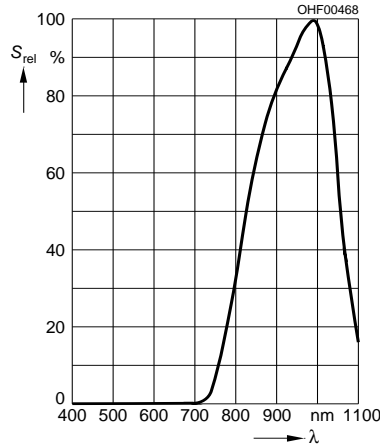
$S_{rel} = f(\varphi)$



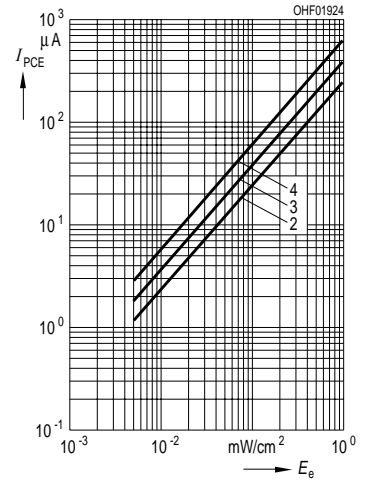
Relative Spectral Sensitivity, SFH 3211 $S_{rel} = f(\lambda)$



Relative Spectral Sensitivity, SFH 3211 FA $S_{rel} = f(\lambda)$

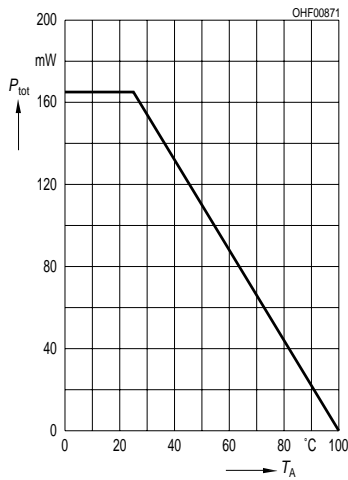


Photocurrent $I_{PCE} = f(E_e), V_{CE} = 5 V$



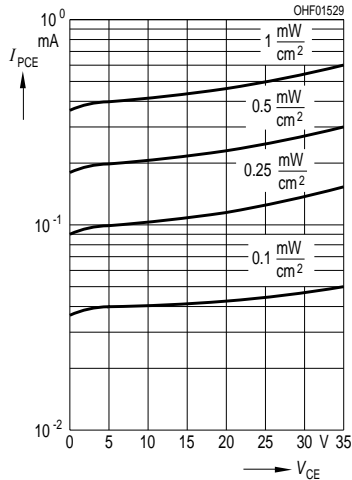
Total Power Dissipation

$P_{tot} = f(T_A)$



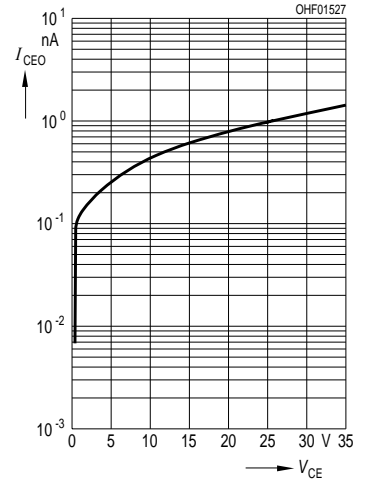
Photocurrent

$I_{PCE} = f(V_{CE}), E_e = \text{Parameter}$



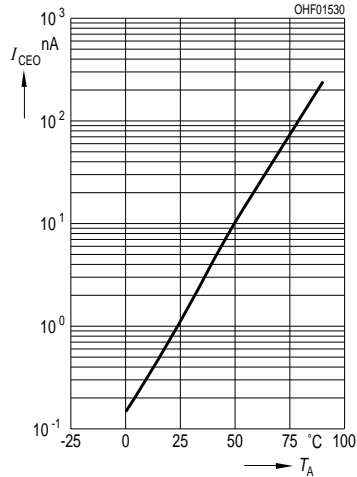
Dark Current

$I_{CEO} = f(V_{CE}), E = 0$



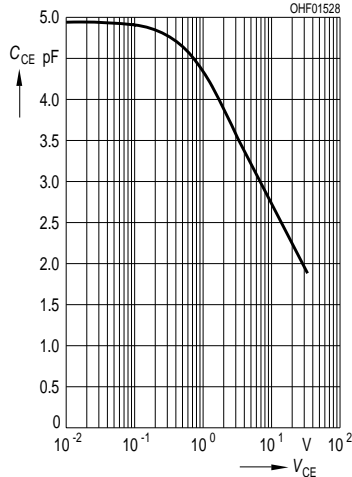
Dark Current

$I_{CEO} = f(T_A), V_{CE} = 5 V, E = 0$



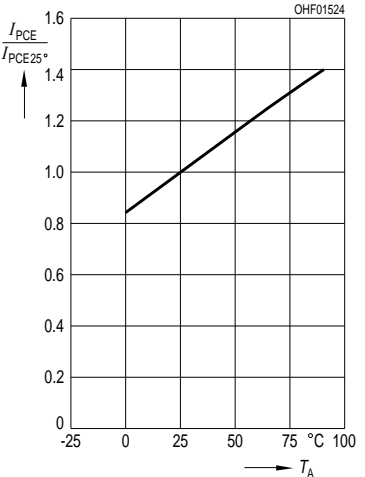
Capacitance

$C_{CE} = f(V_{CE}), f = 1 \text{ MHz}, E = 0$

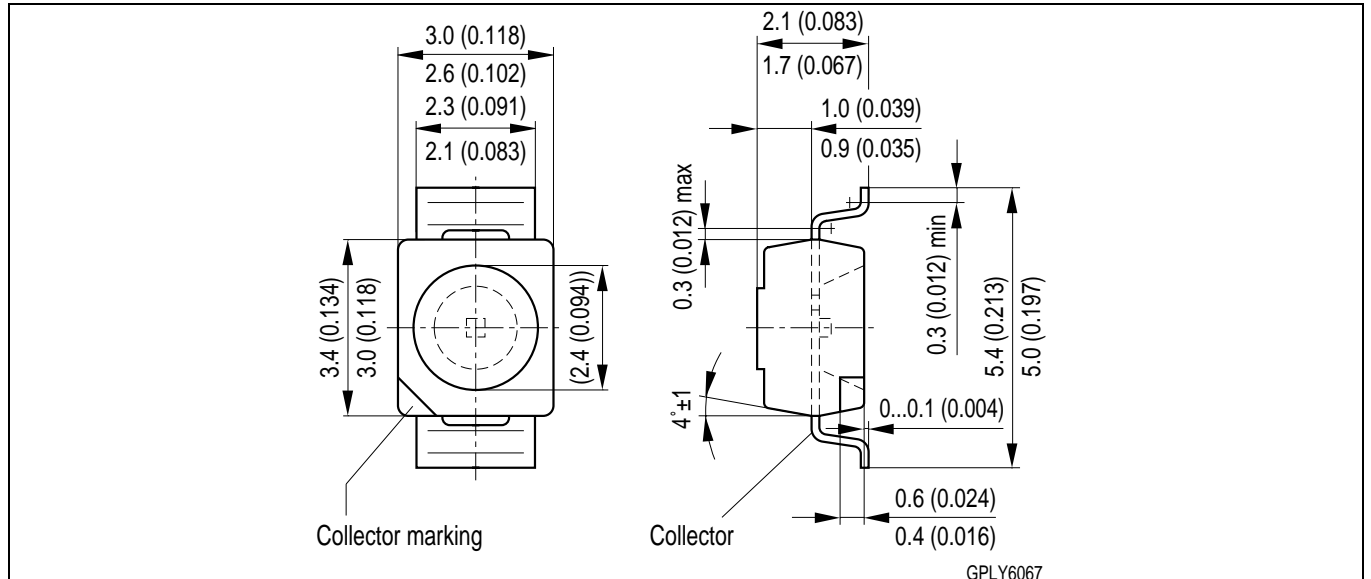


Photocurrent

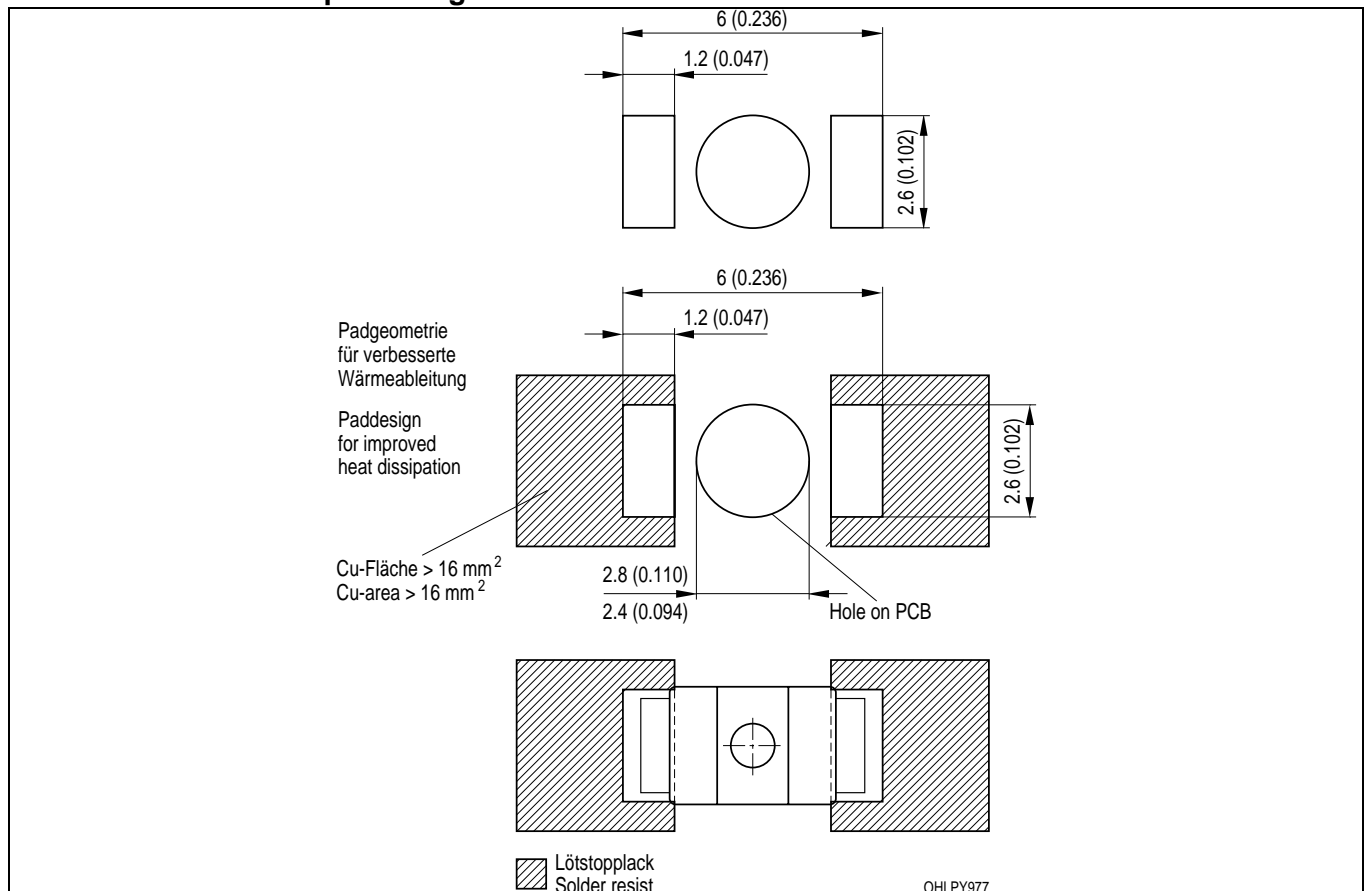
$I_{PCE} / I_{PCE25^\circ} = f(T_A), V_{CE} = 5 V$



**Maßzeichnung
Package Outlines**



**Empfohlenes Lötpaddesign
Recommended Solderpad Design**



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

Lötbedingungen

Soldering Conditions

Reflow Lötprofil für bleifreies Löten

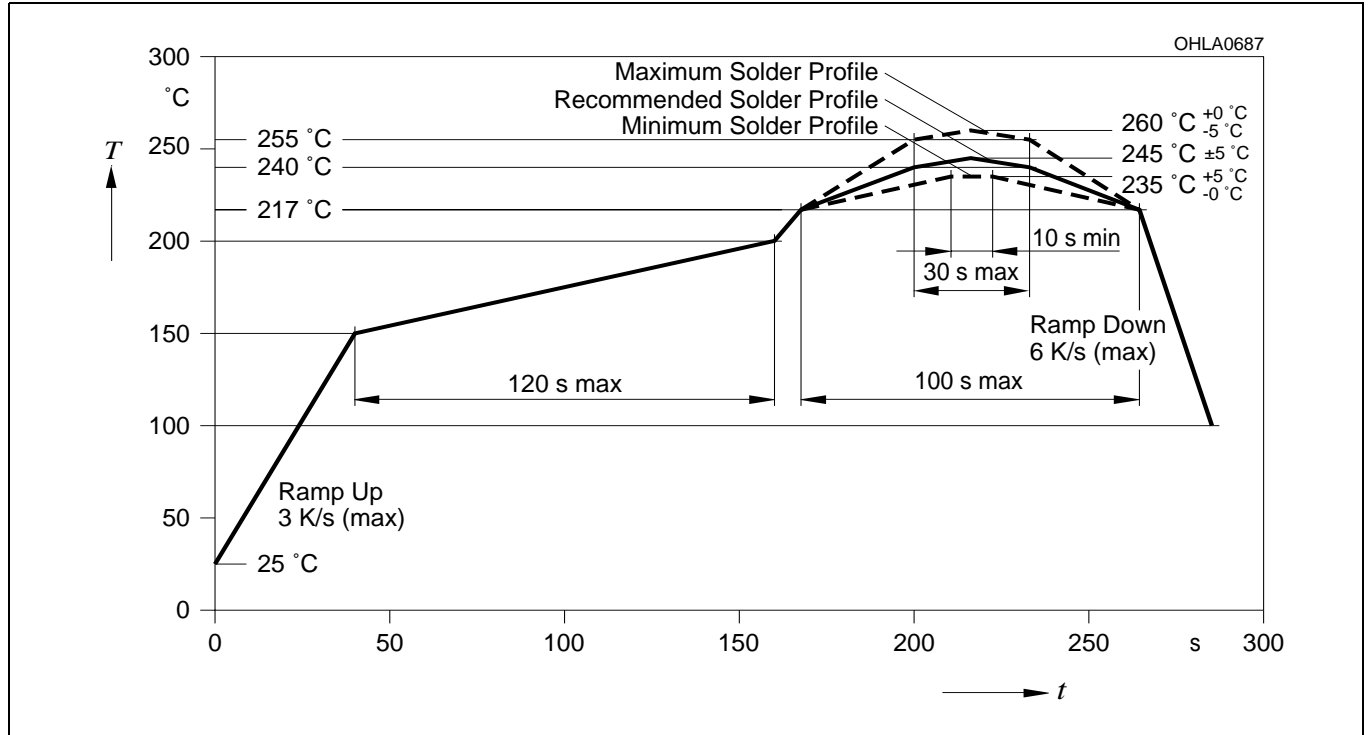
Reflow Soldering Profile for lead free soldering

Vorbehandlung nach JEDEC Level 2

Preconditioning acc. to JEDEC Level 2

(nach J-STD-020C)

(acc. to J-STD-020C)

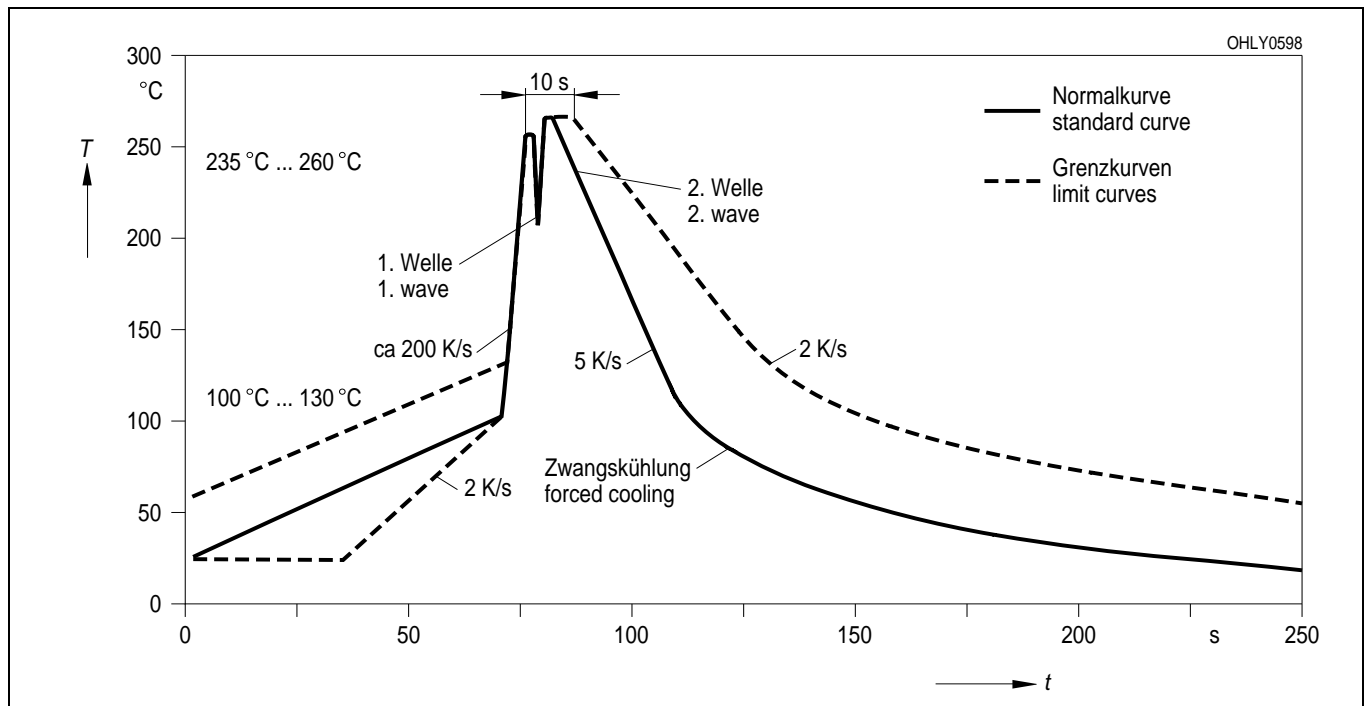


Wellenlöten (TTW)

TTW Soldering

(nach CECC 00802)

(acc. to CECC 00802)



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