

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

SFH 3211
SFH 3211 FA



SFH 3211



SFH 3211 FA

Wesentliche Merkmale

- Speziell geeignet für Anwendungen im Bereich von 380 nm bis 1150 nm (SFH 3211) und bei 880 nm (SFH 3211 FA)
- Hohe Linearität
- Gruppierbar lieferbar

Features

- Especially suitable for applications from 380 nm to 1150 nm (SFH 3211) and of 880 nm (SFH 3211 FA)
- 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
SFH 3211	Q65110A2525
SFH 3211-3/-4	Q65110A2527
SFH 3211 FA	Q65110A2526
SFH 3211 FA-3/-4	Q65110A2528

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
		SFH 3211	SFH 3211 FA	
Wellenlänge der max. Fotoempfindlichkeit Wavelength of max. sensitivity	$\lambda_{S\text{ max}}$	860	900	nm
Spektraler Bereich der Fotoempfindlichkeit $S = 10\%$ von S_{max} Spectral range of sensitivity $S = 10\%$ of S_{max}	λ	380 ...1150	730 ...1120	nm
Bestrahlungsempfindliche Fläche ($\varnothing 240\text{ }\mu\text{m}$) Radiant sensitive area	A	0.045	0.045	mm^2
Abmessung der Chipfläche Dimensions of chip area	$L \times B$ $L \times W$	0.45×0.45	0.45×0.45	$\text{mm} \times \text{mm}$
Halbwinkel Half angle	φ	± 60	± 60	Grad deg.
Kapazität, $V_{\text{CE}} = 0\text{ V}$, $f = 1\text{ MHz}$, $E = 0$ Capacitance	C_{CE}	5.0	5.0	pF
Dunkelstrom Dark current $V_{\text{CE}} = 25\text{ V}$, $E = 0$	I_{CEO}	1 (≤ 200)	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.

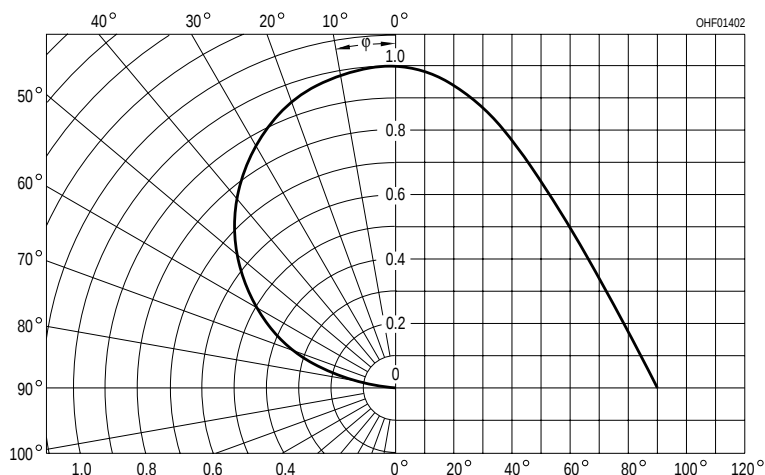
Bezeichnung Parameter	Symbol Symbol	Wert Value				Einheit Unit
		SFH 3211/FA	-2	-3	-4	
Fotostrom, $\lambda = 950 \text{ nm}$ Photocurrent $E_e = 0.1 \text{ mW/cm}^2$, $V_{CE} = 5 \text{ V}$ SFH 3211: $E_v = 1000 \text{ lx}$, Normlicht/ standard light A, $V_{CE} = 5 \text{ V}$	I_{PCE} I_{PCE}	≥ 16	16 ...32 420	25 ...50 650	40 ...80 1000	μA 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.

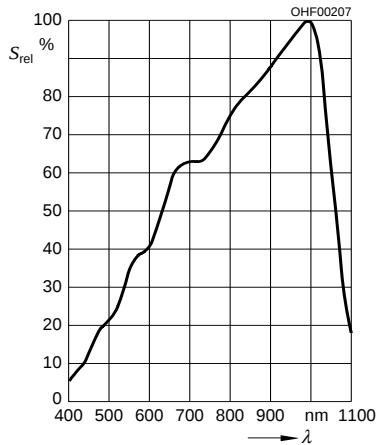
¹⁾ I_{PCEmin} is the min. photocurrent of the specified group.

Directional Characteristics

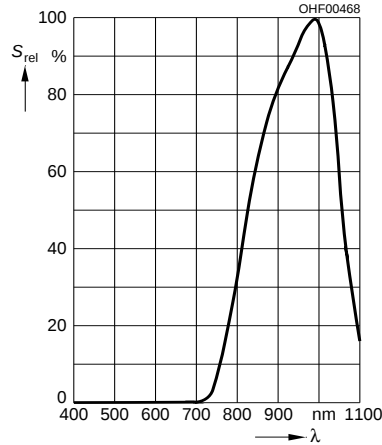
$$S_{rel} = f(\varphi)$$



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

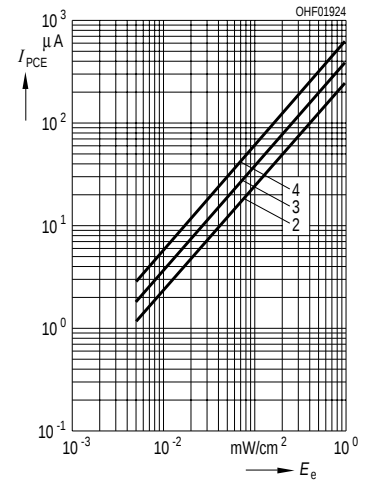


Relative Spectral Sensitivity,
SFH 3211 FA $S_{rel} = f(\lambda)$

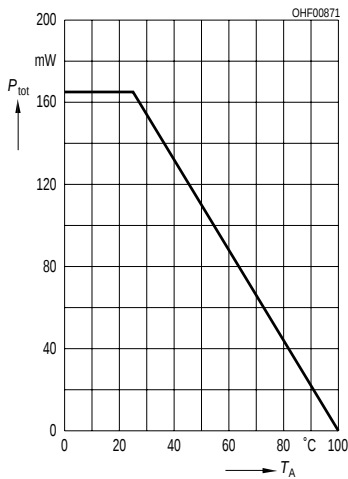


Photocurrent

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

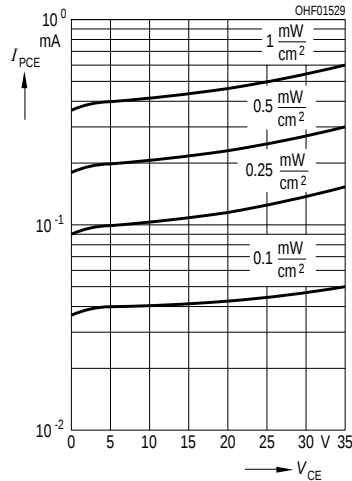


Total Power Dissipation
 $P_{tot} = f(T_A)$



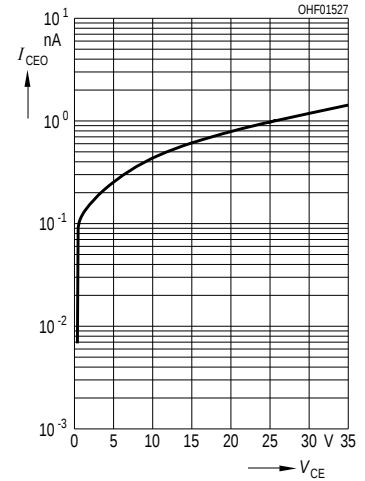
Photocurrent

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



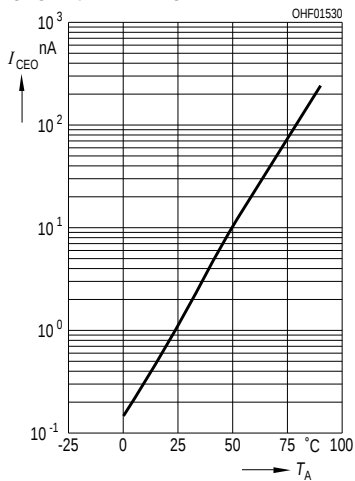
Dark Current

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



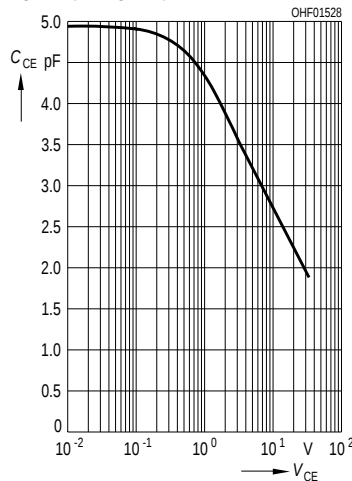
Dark Current

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



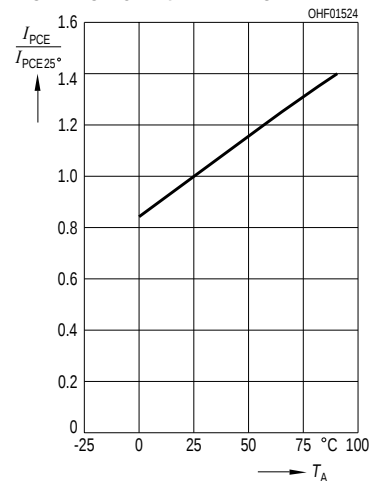
Capacitance

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

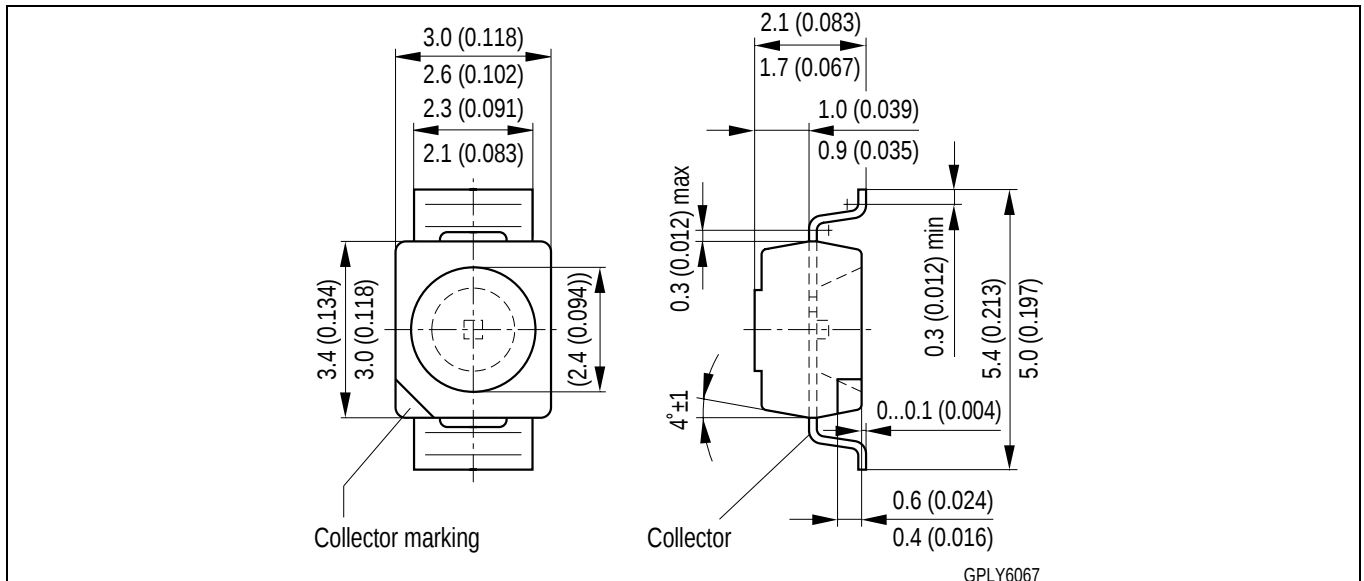


Photocurrent

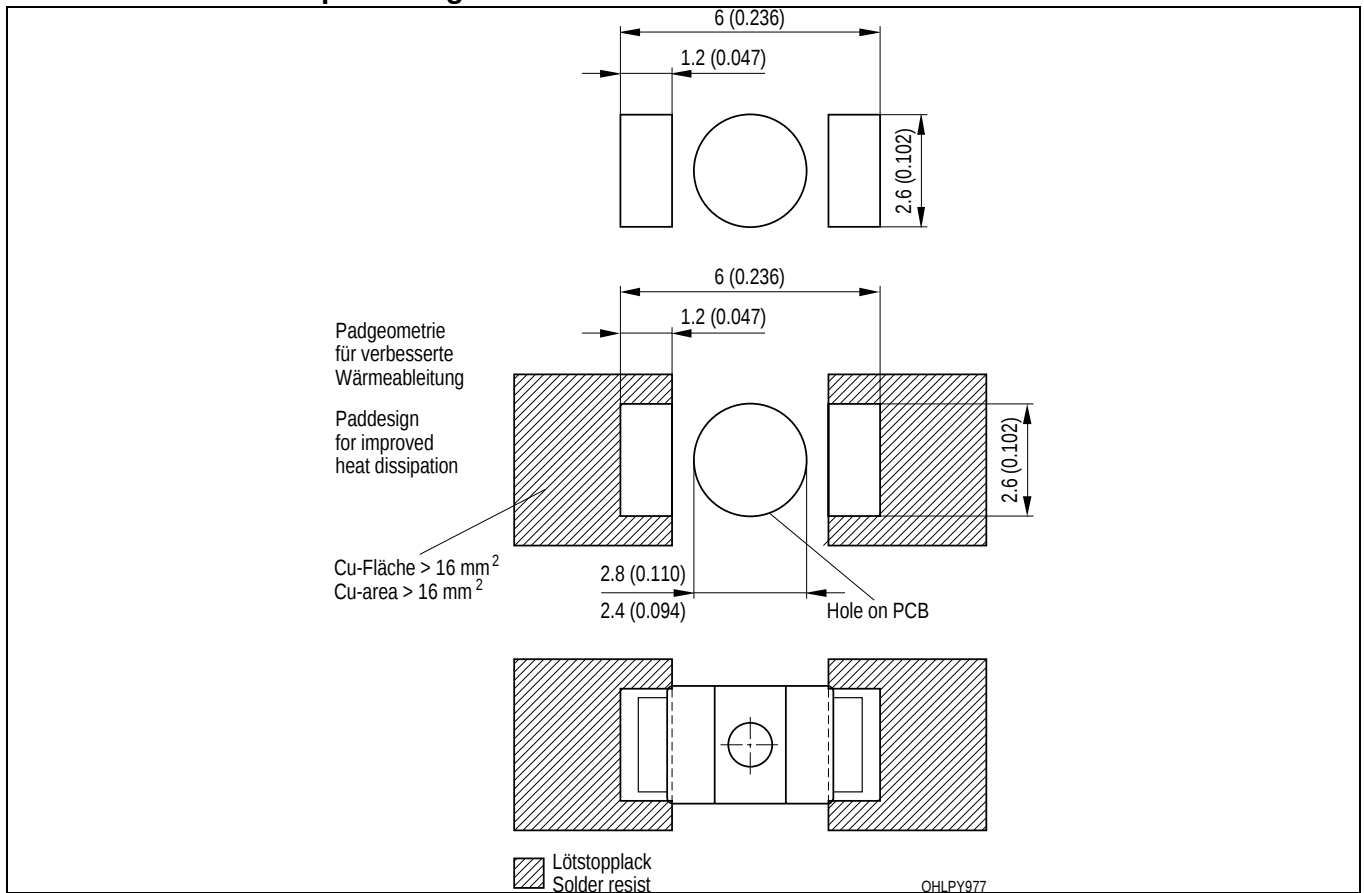
$$I_{PCE} / I_{PCE25^\circ} = f(T_A), V_{CE} = 5 \text{ V}$$



Maßzeichnung Package Outlines



Empfohlenes Lötpad-Design Recommended Solderpad Design



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

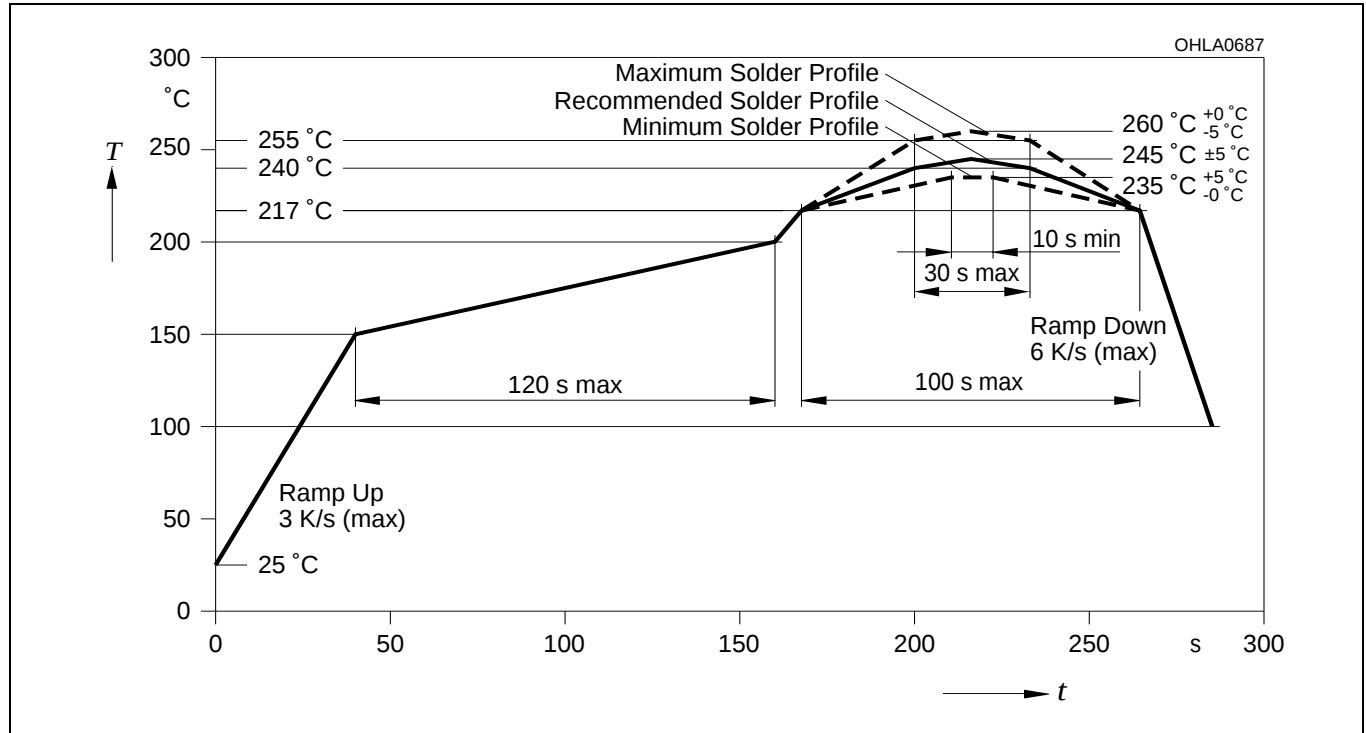
Lötbedingungen**Soldering Conditions****IR-Reflow Lötprofil für bleifreies Löten****IR Reflow Soldering Profile for lead free soldering**

Vorbehandlung nach JEDEC Level 2

Preconditioning acc. to JEDEC Level 2

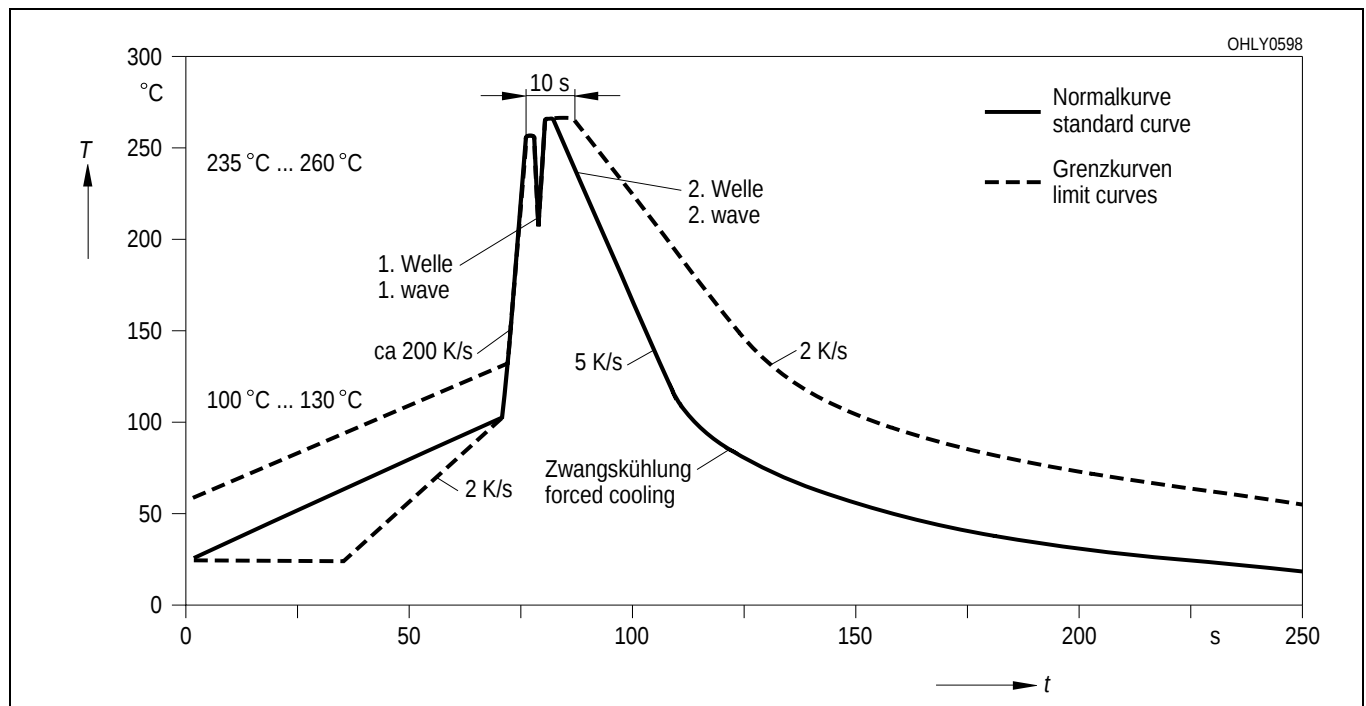
(nach J-STD-020B)

(acc. to J-STD-020B)

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

(nach CECC 00802)

(acc. to CECC 00802)



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¹ 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.

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