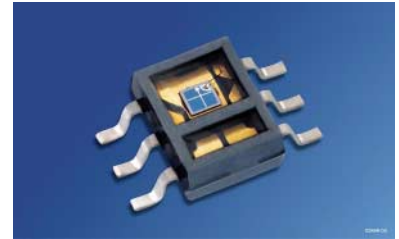


# NPN-Silizium-Fototransistor im SMT-Gehäuse

## Silicon NPN Phototransistor in SMT Package

### Lead (Pb) Free Product - RoHS Compliant

**SFH 3201**



#### Wesentliche Merkmale

- Speziell geeignet für Anwendungen im Bereich von 460 nm bis 1080 nm
- Hohe Linearität
- Nur gegurtet lieferbar

#### Anwendungen

- Umgebungslicht-Detektor
- Lichtschranken für Gleich- und Wechsellichtbetrieb
- Industrieelektronik
- „Messen/Steuern/Regeln“

#### Features

- Especially suitable for applications from 460 nm to 1080 nm
- High linearity
- Available only on tape and reel

#### Applications

- Ambient light detector
- Photointerrupters
- Industrial electronics
- For control and drive circuits

Typ Type	Bestellnummer Ordering Code
SFH 3201	Q65110A1207
SFH 3201-2/3	Q65110A2479

**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	$V_{CE}$	20	V
Kollektor-Emitterspannung, $t < 120$ s Collector-emitter voltage	$V_{CE}$	70	V
Kollektorstrom Collector current	$I_C$	50	mA
Kollektorspitzenstrom, $\tau < 10 \mu s$ Collector surge current	$I_{CS}$	100	mA
Emitter-Kollektorspannung Emitter-collector voltage	$V_{EC}$	7	V
Verlustleistung, $T_A = 25 \text{ °C}$ Total power dissipation	$P_{tot}$	120	mW
Wärmewiderstand für Montage auf PC-Board Thermal resistance for mounting on pcb	$R_{thJA}$	500	K/W

Kennwerte ( $T_A = 25\text{ °C}$ )

## Characteristics

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Wellenlänge der max. Fotoempfindlichkeit Wavelength of max. sensitivity	$\lambda_{S\text{ max}}$	850	nm
Spektraler Bereich der Fotoempfindlichkeit $S = 10\%$ von $S_{\text{max}}$ Spectral range of sensitivity $S = 10\%$ of $S_{\text{max}}$	$\lambda$	460 ... 1080	nm
Bestrahlungsempfindliche Fläche Radiant sensitive area	$A$	0.55	mm <sup>2</sup>
Abmessung der Chipfläche Dimensions of chip area	$L \times B$ $L \times W$	1 × 1	mm × mm
Halbwinkel Half angle	$\varphi$	± 60	Grad deg.
Kapazität, $V_{\text{CE}} = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$ Capacitance	$C_{\text{CE}}$	15	pF
Dunkelstrom Dark current $V_{\text{CE}} = 20\text{ V}$ , $E = 0$	$I_{\text{CEO}}$	3 ( $\leq 200$ )	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.

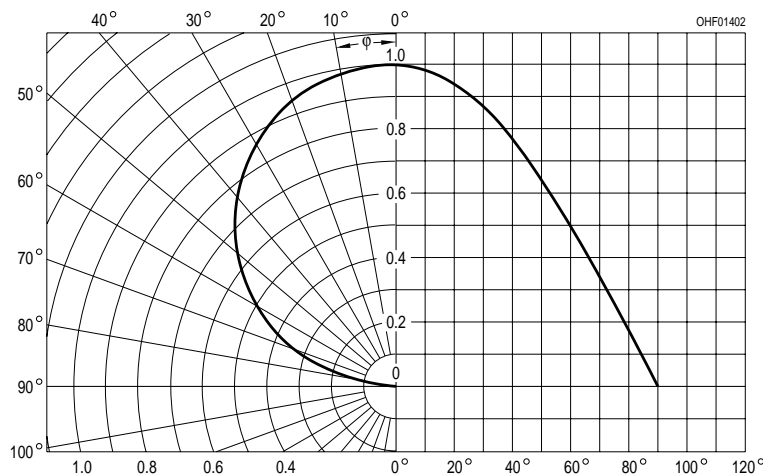
Bezeichnung Parameter	Symbol Symbol	Wert Value			Einheit Unit
		-1	-2	-3	
Fotostrom, $\lambda = 950 \text{ nm}$ Photocurrent $E_e = 0.1 \text{ mW/cm}^2$ , $V_{CE} = 5 \text{ V}$ $E_v = 1000 \text{ lx}$ , Normlicht/ standard light A, $V_{CE} = 5 \text{ V}$	$I_{PCE}$	63 ... 125	100 ... 200	160 ... 320	$\mu\text{A}$
	$I_{PCE}$	1.65	2.6	4.2	mA
Anstiegszeit/Abfallzeit Rise and fall time $I_C = 1 \text{ mA}$ , $V_{CC} = 5 \text{ V}$ , $R_L = 1 \text{ k}\Omega$	$t_r$ , $t_f$	16	24	34	$\mu\text{s}$
Kollektor-Emitter- Sättigungsspannung Collector-emitter saturation voltage $I_C = I_{PCEmin}^{1)} \times 0.3$ , $E_e = 0.1 \text{ mW/cm}^2$	$V_{CEsat}$	170 ( $\leq 250$ )	170 ( $\leq 250$ )	170 ( $\leq 250$ )	mV

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

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

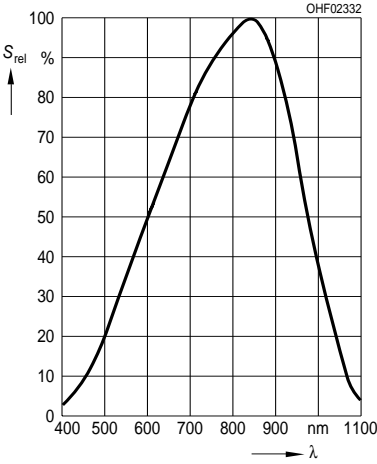
### Directional Characteristics

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

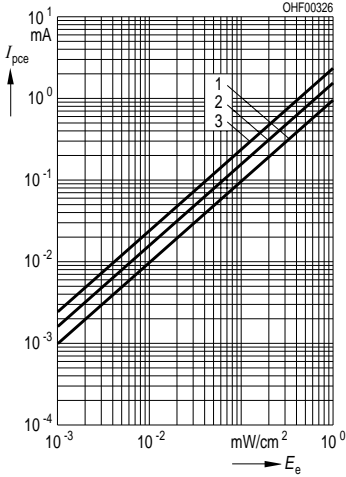


$T_A = 25\text{ °C}$ ,  $\lambda = 950\text{ nm}$

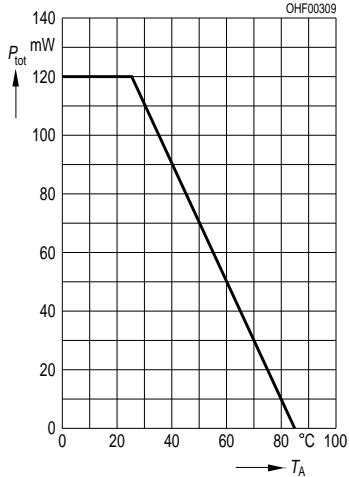
Rel. Spectral Sensitivity,  
 $S_{rel} = f(\lambda)$



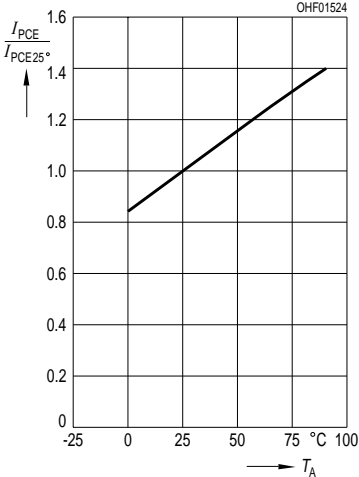
Photocurrent  
 $I_{PCE} = f(E_e), V_{CE} = 5\text{ V}$



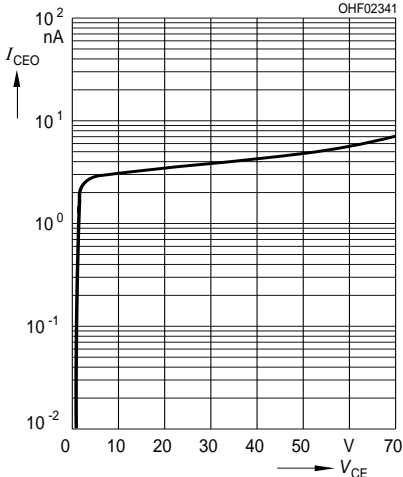
Total Power Dissipation  
 $P_{tot} = f(T_A)$



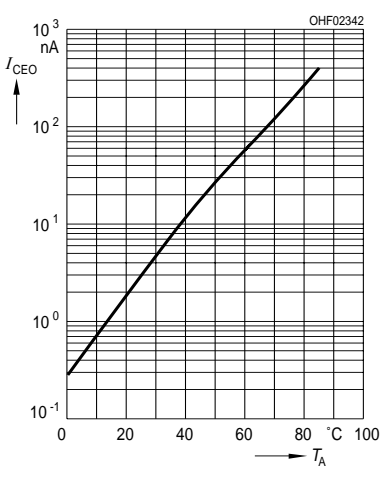
Photocurrent  $I_{PCE} = f(T_A)$ ,  
 $V_{CE} = 5\text{ V}$ , normalized to  $25\text{ °C}$



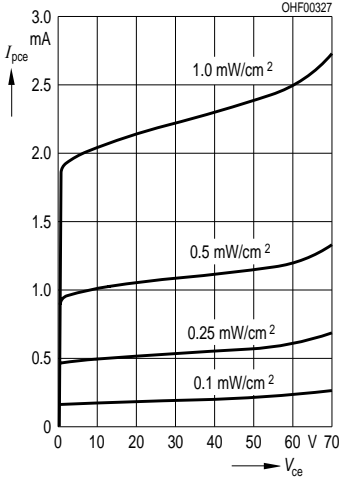
Dark Current  
 $I_{CEO} = f(V_{CE}), E = 0$



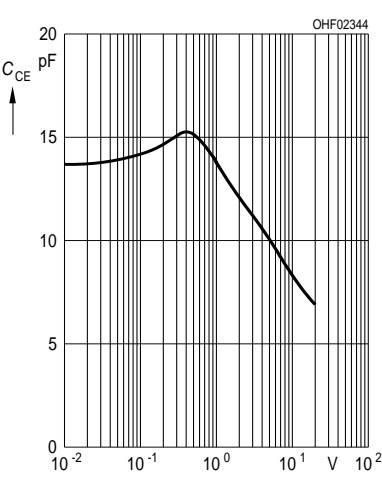
Dark Current  
 $I_{CEO} = f(T_A), V_{CE} = 10\text{ V}, E = 0$



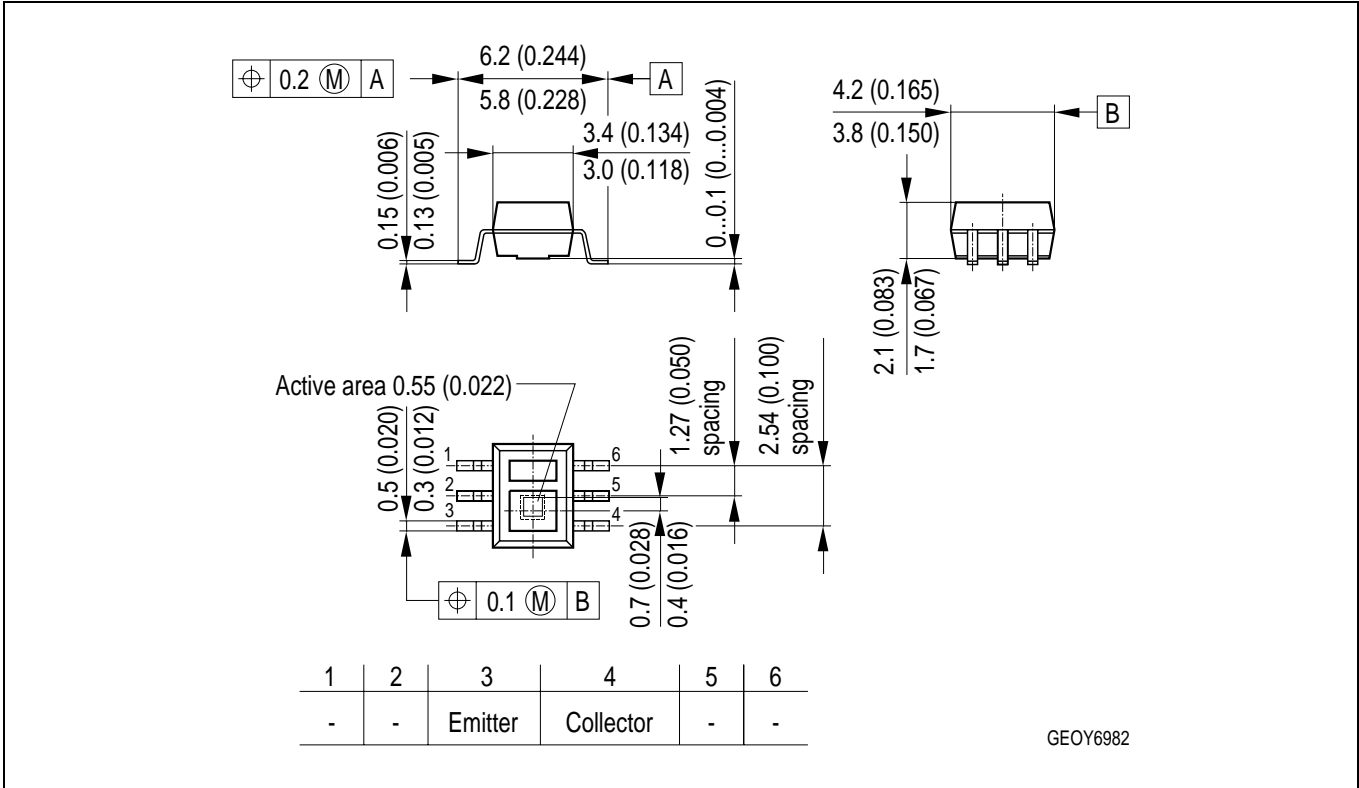
Photocurrent  
 $I_{PCE} = f(V_{CE})$



Collector-Emitter Capacitance  
 $C_{CE} = f(V_{CE}), f = 1\text{ MHz}$



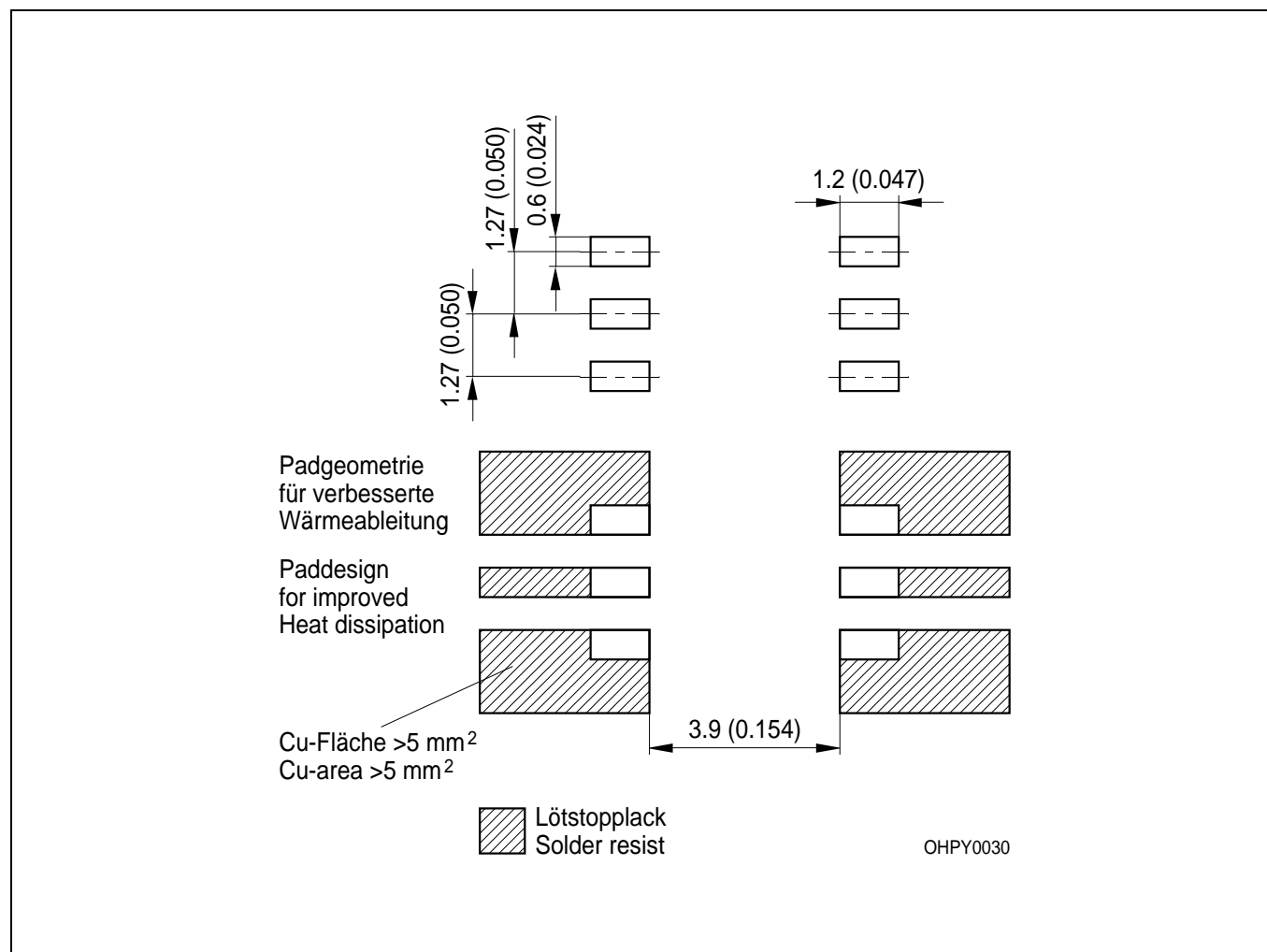
Maßzeichnung  
Package Outlines



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

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

Reflow Lötten  
 Reflow Soldering



**Lötbedingungen**

**Soldering Conditions**

**Reflow Lötprofil für bleifreies Löten**

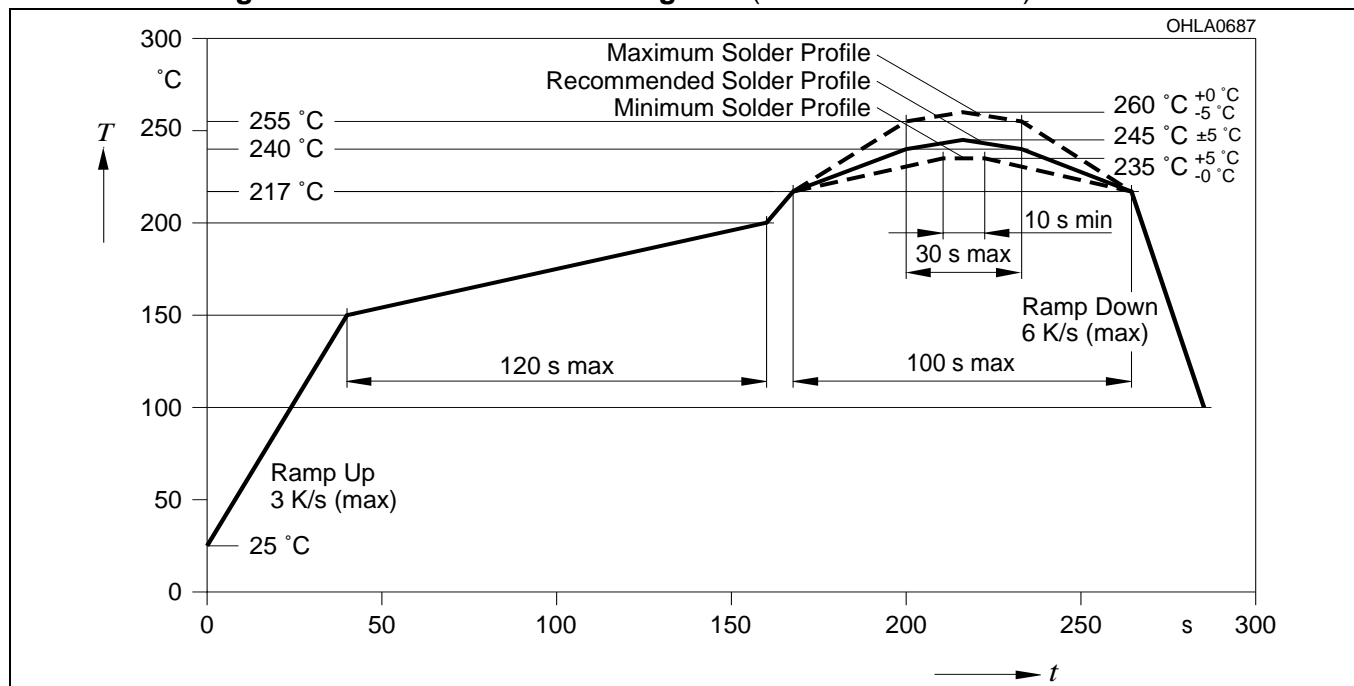
**Reflow Soldering Profile for lead free soldering**

Vorbehandlung nach JEDEC Level 4

Preconditioning acc. to JEDEC Level 4

(nach J-STD-020C)

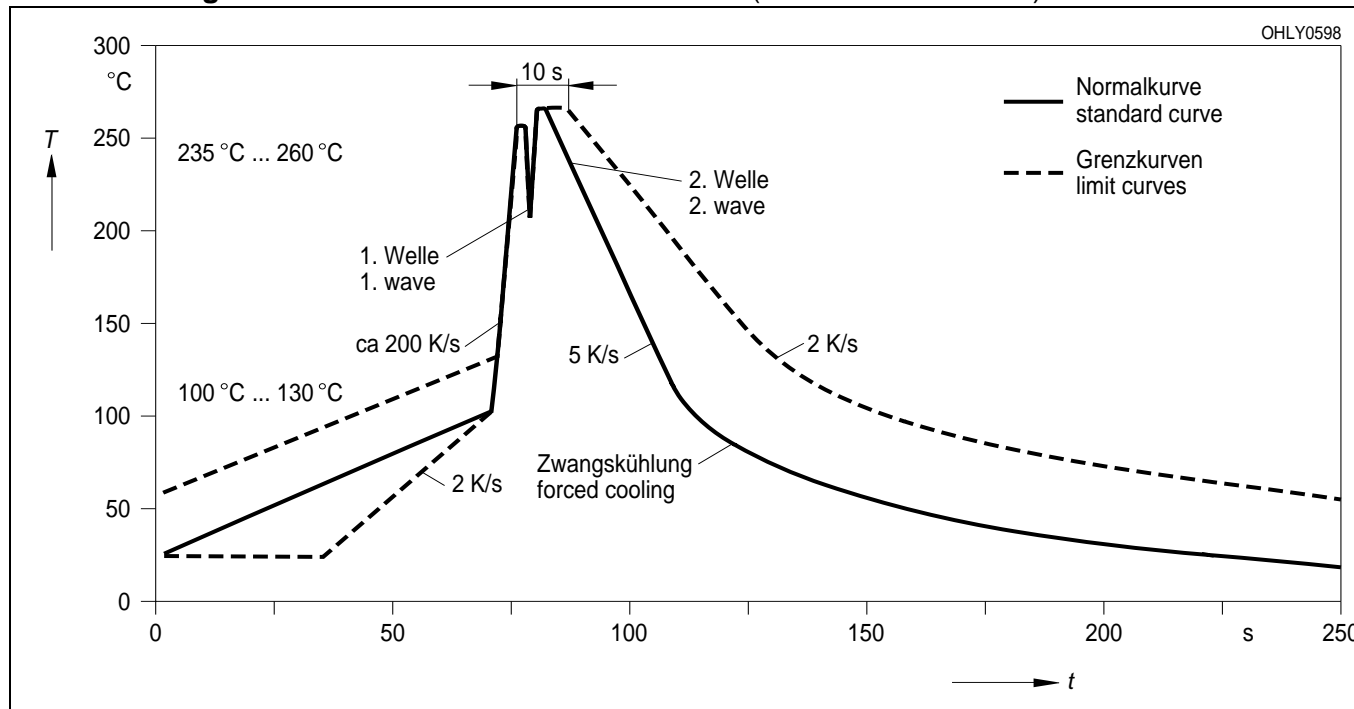
(acc. to J-STD-020C)



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

(nach CECC 00802)

(acc. to CECC 00802)





Published by  
OSRAM Opto Semiconductors GmbH  
Wernerwerkstrasse 2, D-93049 Regensburg  
[www.osram-os.com](http://www.osram-os.com)

© All Rights Reserved.

The information describes the type of component and shall not be considered as assured characteristics. Terms of delivery and rights to change design reserved. Due to technical requirements components may contain dangerous substances. For information on the types in question please contact our Sales Organization.

#### Packing

Please use the recycling operators known to you. We can also help you – get in touch with your nearest sales office. By agreement we will take packing material back, if it is sorted. You must bear the costs of transport. For packing material that is returned to us unsorted or which we are not obliged to accept, we shall have to invoice you for any costs incurred.

**Components used in life-support devices or systems must be expressly authorized for such purpose!** Critical components <sup>1</sup>, may only be used in life-support devices or systems <sup>2</sup> with the express written approval of OSRAM OS.

<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.

EU RoHS and China RoHS compliant product



此产品符合欧盟 RoHS 指令的要求；

按照中国的相关法规和标准，不含有毒有害物质或元素。