

# GaAs-IR-Lumineszenzdiode in SMT-Gehäuse

## GaAs Infrared Emitter in SMT Package

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

**SFH 420**  
**SFH 425**



SFH 420



SFH 425

#### Wesentliche Merkmale

- GaAs-LED mit sehr hohem Wirkungsgrad
- Gute Linearität ( $I_e = f[I_F]$ ) bei hohen Strömen
- Gleichstrom- (mit Modulation) oder Impulsbetrieb möglich
- Hohe Zuverlässigkeit
- Hohe Impulsbelastbarkeit
- Oberflächenmontage geeignet
- Gegurtet lieferbar
- SFH 420 Gehäusegleich mit SFH 320
- SFH 425 Gehäusegleich mit SFH 325
- SFH 425: Nur für IR-Reflow-Lötung geeignet.

#### Anwendungen

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

#### Features

- Very highly efficient GaAs-LED
- Good Linearity ( $I_e = f[I_F]$ ) at high currents
- DC (with modulation) or pulsed operations are possible
- High reliability
- High pulse handling capability
- Suitable for surface mounting (SMT)
- Available on tape and reel
- SFH 420 same package as SFH 320
- SFH 425 same package as SFH 325
- SFH 425: Suitable only for IR-reflow soldering.

#### Applications

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

Typ Type	Bestellnummer Ordering Code	Gehäuse Package
SFH 420	Q65110A2473	Kathodenkennzeichnung: abgesetzte Ecke cathode marking: beveled edge
SFH 425	Q65110A2463	TOPLED® SIDELED®

**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	$I_{FSM}$	3	A
Verlustleistung Power dissipation	$P_{tot}$	160	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	$R_{thJS}$	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 $I_F = 100\ \text{mA}$ , $t_p = 20\ \text{ms}$	$\lambda_{peak}$	950	nm
Spektrale Bandbreite bei 50% von $I_{max}$ Spectral bandwidth at 50% of $I_{max}$ $I_F = 100\ \text{mA}$	$\Delta\lambda$	55	nm
Abstrahlwinkel Half angle	$\varphi$	$\pm 60$	Grad deg.
Aktive Chipfläche Active chip area	$A$	0.09	$\text{mm}^2$
Abmessungen der aktiven Chipfläche Dimensions 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)

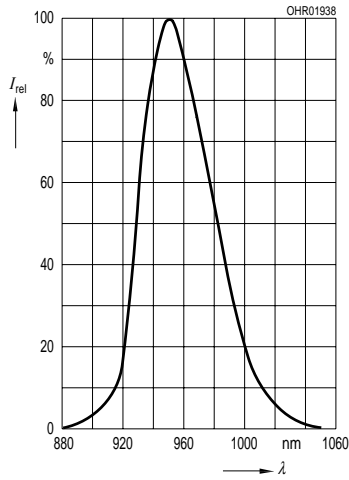
Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Schaltzeiten, $I_e$ von 10% auf 90% und von 90% auf 10%, bei $I_F = 100\text{ mA}$ , $R_L = 50\ \Omega$ Switching times, $I_e$ from 10% to 90% and from 90% to 10%, $I_F = 100\text{ mA}$ , $R_L = 50\ \Omega$	$t_r, t_f$	0.5	$\mu\text{s}$
Kapazität Capacitance $V_R = 0\text{ V}$ , $f = 1\text{ MHz}$	$C_o$	25	pF
Durchlassspannung Forward voltage $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$ $I_F = 1\text{ A}$ , $t_p = 100\ \mu\text{s}$	$V_F$ $V_F$	1.3 ( $\leq 1.5$ ) 1.9 ( $\leq 2.5$ )	V V
Sperrstrom Reverse current $V_R = 5\text{ V}$	$I_R$	0.01 ( $\leq 1$ )	$\mu\text{A}$
Gesamtstrahlungsfluss Total radiant flux $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$	$\Phi_e$	14	mW
Temperaturkoeffizient von $I_e$ bzw. $\Phi_e$ , $I_F = 100\text{ mA}$ Temperature coefficient of $I_e$ or $\Phi_e$ , $I_F = 100\text{ mA}$	$TC_I$	- 0.55	%/K
Temperaturkoeffizient von $V_F$ , $I_F = 100\text{ mA}$ Temperature coefficient of $V_F$ , $I_F = 100\text{ mA}$	$TC_V$	- 1.5	mV/K
Temperaturkoeffizient von $\lambda$ , $I_F = 100\text{ mA}$ Temperature coefficient of $\lambda$ , $I_F = 100\text{ mA}$	$TC_\lambda$	+ 0.3	nm/K

**Strahlstärke  $I_e$  in Achsrichtung** (gemessen bei einem Raumwinkel  $\Omega = 0.01\text{ sr}$ )  
**Radiant Intensity  $I_e$  in Axial Direction** (at a solid angle of  $\Omega = 0.01\text{ sr}$ )

Bezeichnung Parameter	Symbol	Werte Values	Einheit Unit
Strahlstärke Radiant intensity $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$	$I_{e\text{ min}}$ $I_{e\text{ typ}}$	2.5 5.0	mW/sr mW/sr
Strahlstärke Radiant intensity $I_F = 1\text{ A}$ , $t_p = 100\ \mu\text{s}$	$I_{e\text{ typ.}}$	38	mW/sr

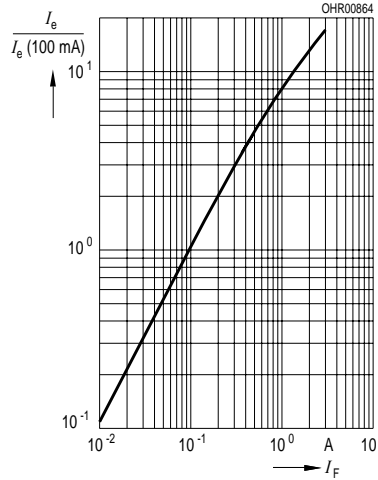
**Relative Spectral Emission**

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



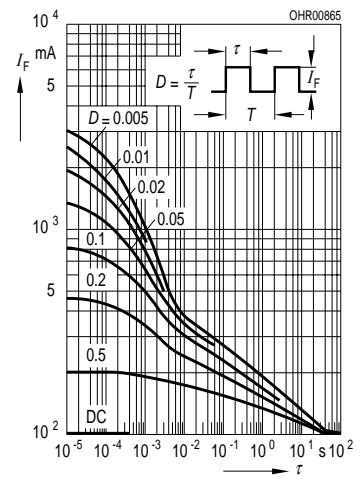
**Radiant Intensity**  $\frac{I_e}{I_e \text{ 100 mA}} = f(I_F)$

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



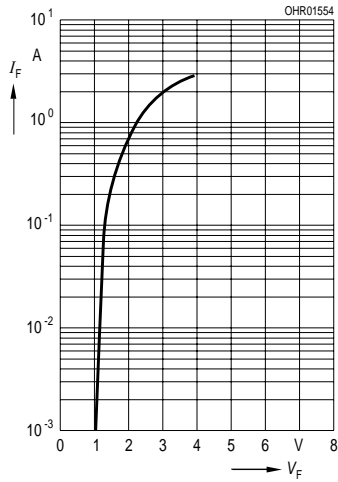
**Permissible Pulse Handling Capability**

$I_F = f(t_p)$ , duty cycle  $D = \text{parameter}$ ,  $T_A = 20 \text{ }^\circ\text{C}$



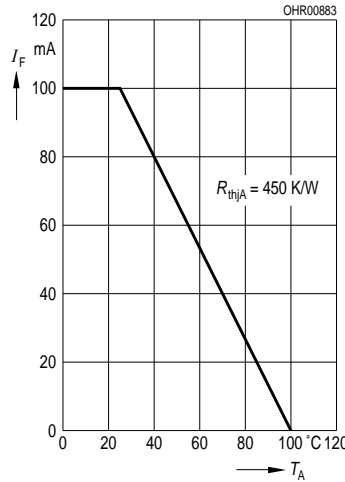
**Forward Current**

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



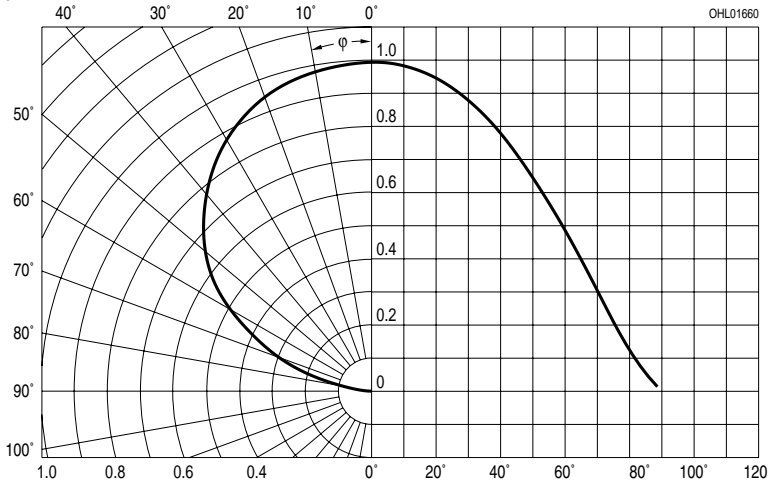
**Max. Permissible Forward Current**

$I_F = f(T_A)$

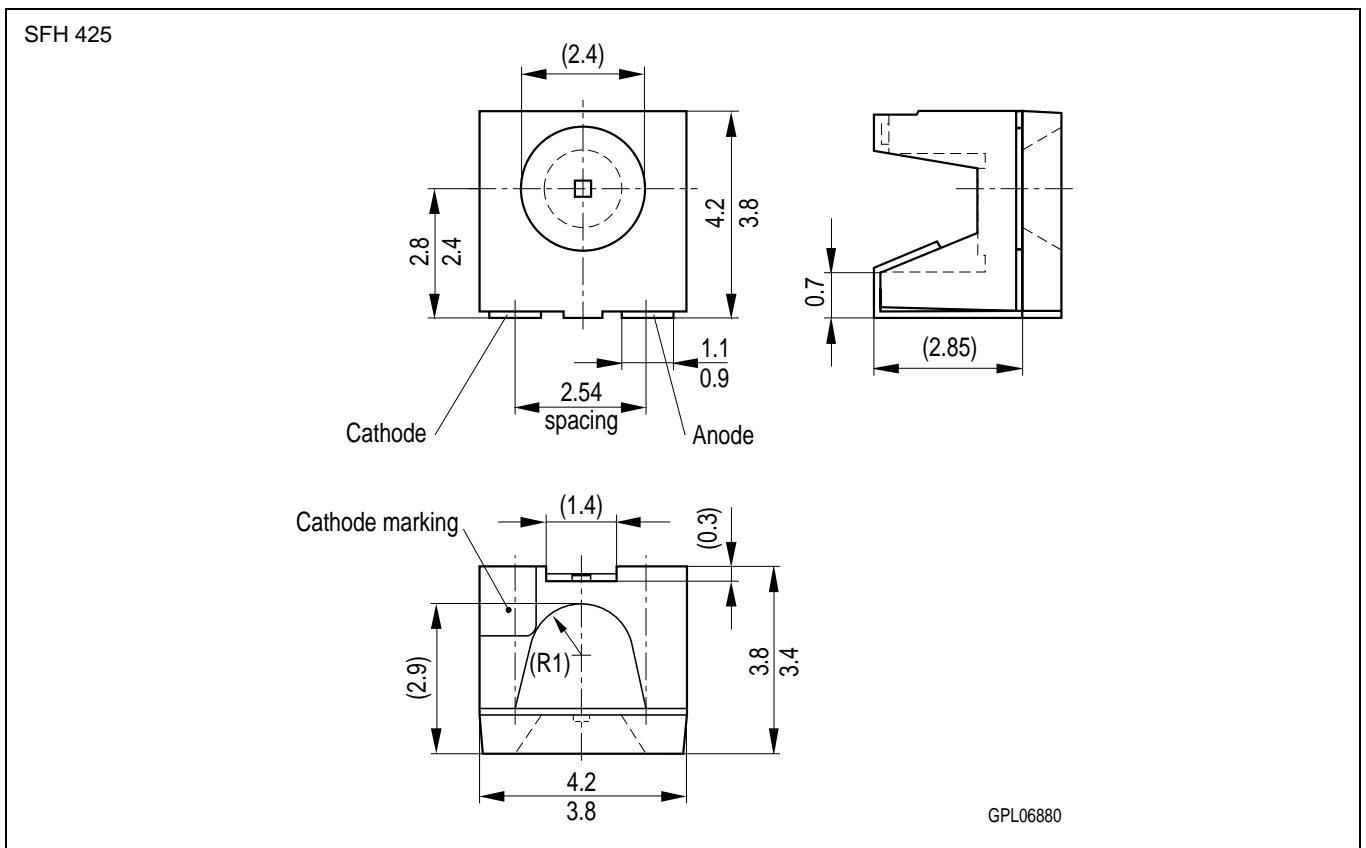
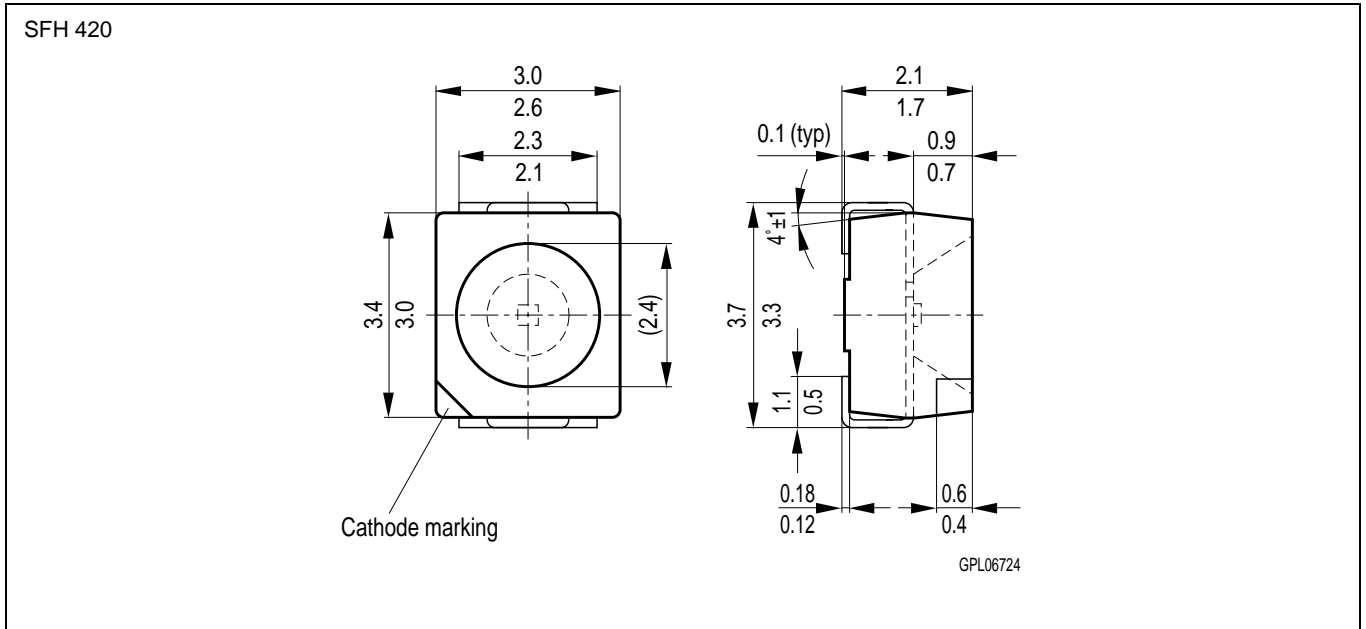


**Radiation Characteristics**

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



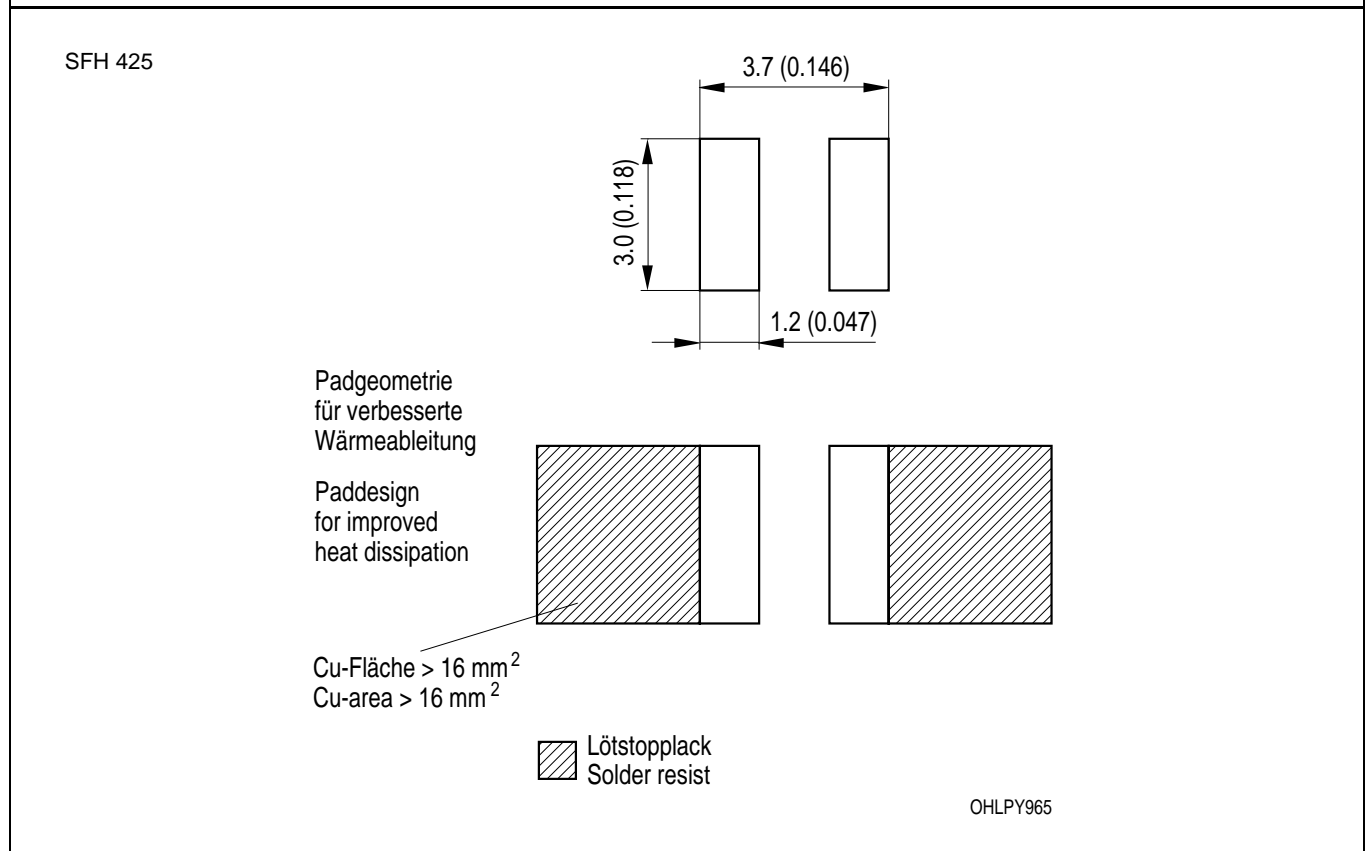
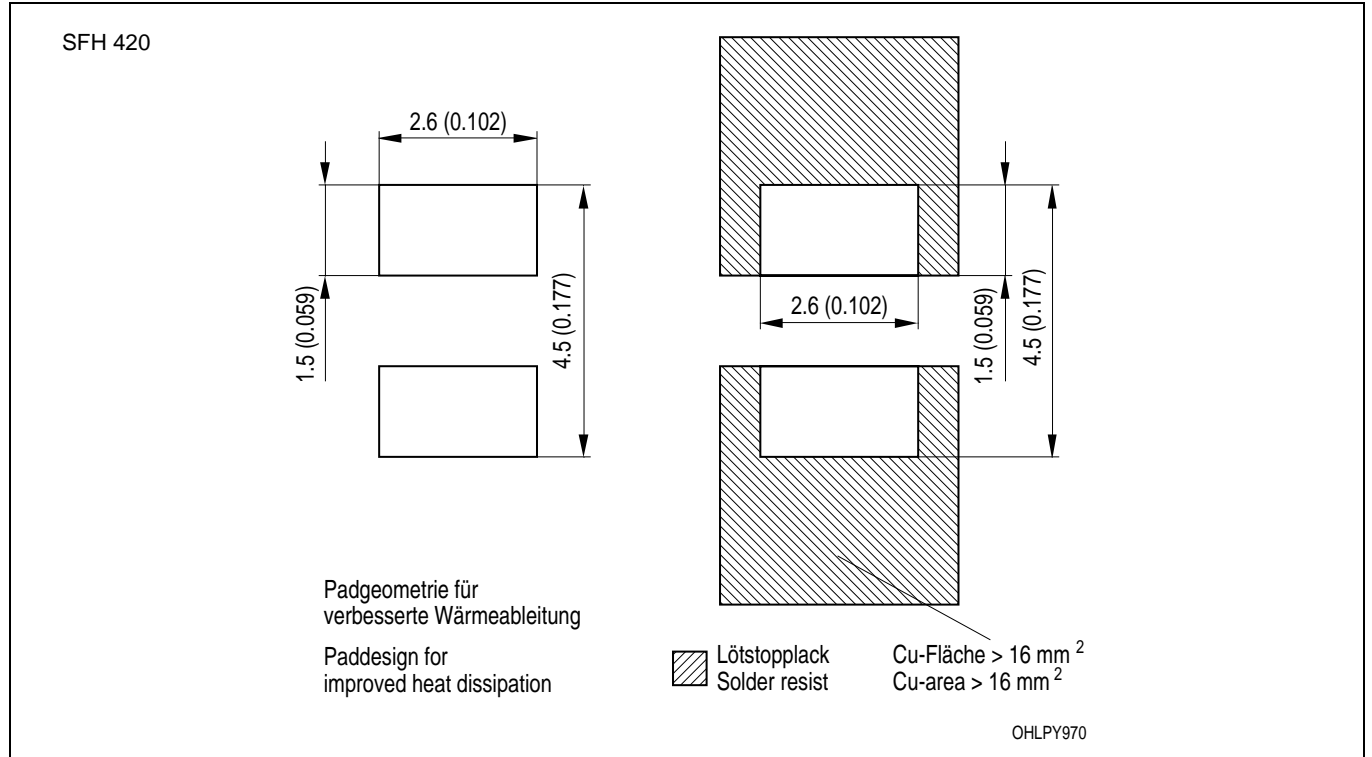
Maßzeichnung  
Package Outlines



Maße in mm, wenn nicht anders angegeben / Dimensions in mm, unless otherwise specified.

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

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



**Lötbedingungen**

**Soldering Conditions**

**IR-Reflow Lötprofil für bleifreies Löten**

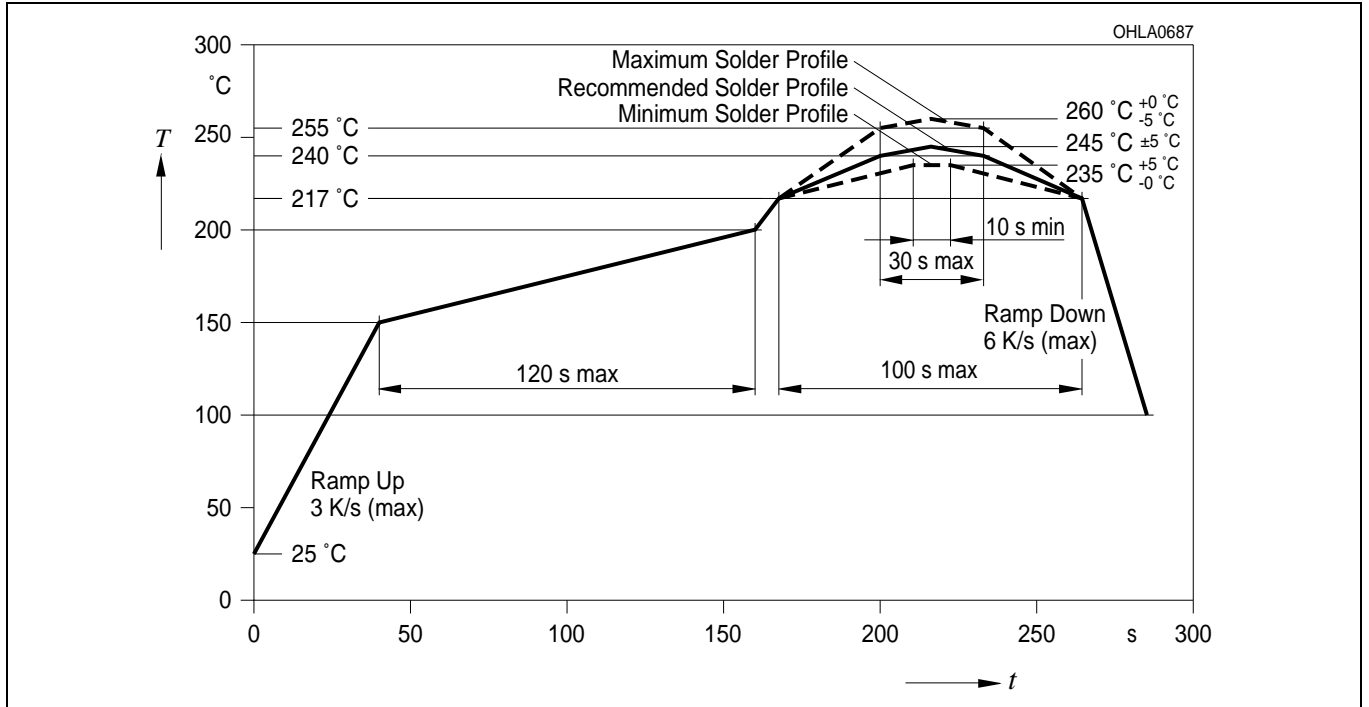
**IR Reflow Soldering Profile for lead free soldering**

Vorbehandlung nach JEDEC Level 2

Preconditioning acc. to JEDEC Level 2

(nach J-STD-020B)

(acc. to J-STD-020B)

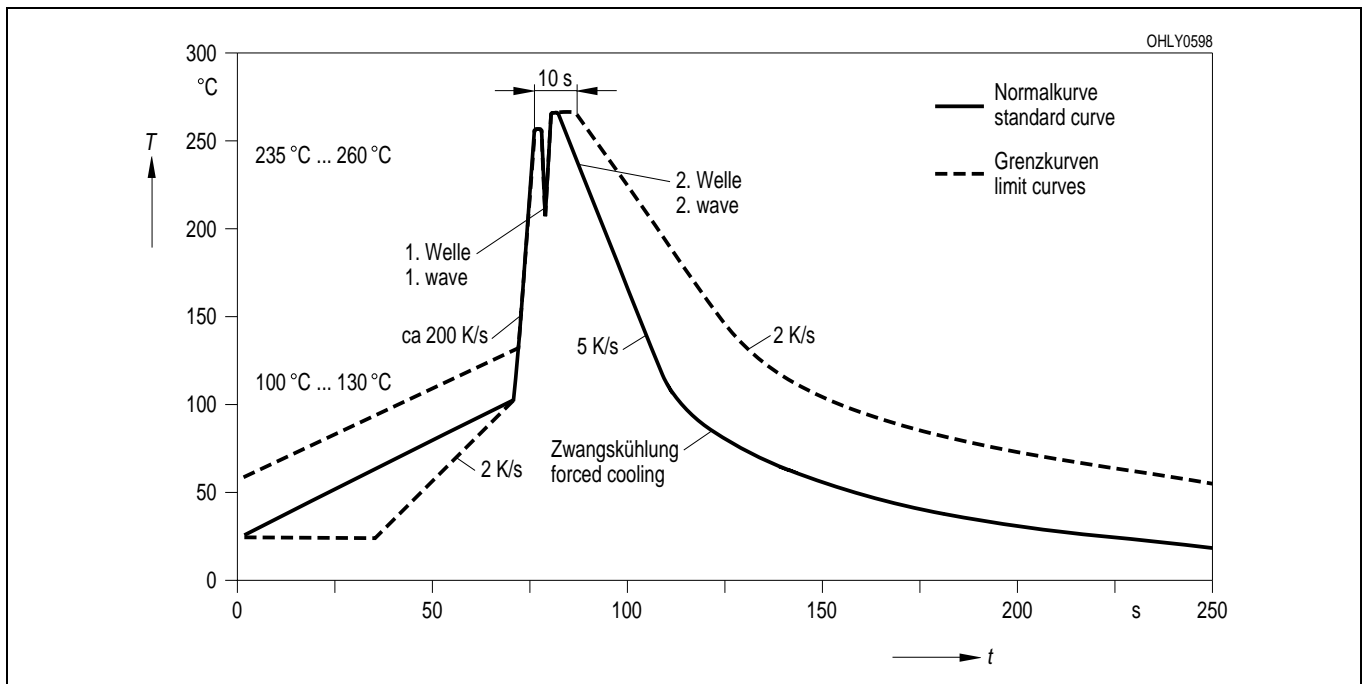


**Wellenlöten (TTW)**

**TTW Soldering**

(nach CECC 00802)

(acc. to CECC 00802)



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