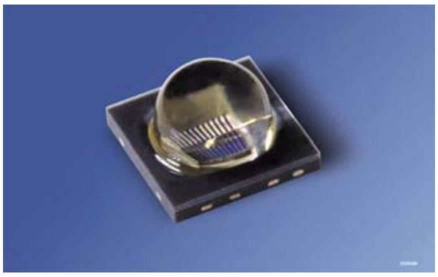
OSLON Black Series (940 nm)
Lead (Pb) Free Product - RoHS Compliant

SFH 4725S



DRAFT - This design is for Reference only.

Subject to change without notice.

Wesentliche Merkmale
- IR-Lichtquelle mit hohem Wirkungsgrad
- niedriger Wärmewiderstand (Max. 11 K/W)
- Schwerpunktswellenlänge 940 nm
- ESD-sicher bis 2 kV nach JESD22-A114-E
- Erweiterte Korrosionsfestigkeit
  (s.a. Abschnitt Maßzeichnung)

Anwendungen
- Infrarotbeleuchtung für Kameras
- Überwachungssysteme
- Beleuchtung für Bilderkennungssysteme

Sicherheitshinweise
Je nach Betriebsart emittieren diese Bauteile hochkonzentrierte, nicht sichtbare Infrarot-Strahlung, die gefährlich für das menschliche Auge sein kann. Produkte, die diese Bauteile enthalten, müssen gemäß den Sicherheitsrichtlinien der IEC-Normen 60825-1 und 62471 behandelt werden.

Features
- IR lightsource with high efficiency
- Low thermal resistance (Max. 11 K/W)
- Center of spectral emission at 940 nm
- ESD safe up to 2 kV acc. to JESD22-A114-E
- Superior Corrosion Robustness
  (see chapter package outlines)

Applications
- Infrared Illumination for cameras
- Surveillance systems
- Machine vision systems

Safety Advices
Depending on the mode of operation, these devices emit highly concentrated non visible infrared light which can be hazardous to the human eye. Products which incorporate these devices have to follow the safety precautions given in IEC 60825-1 and IEC 62471.

Typ **Type**	**Bestellnummer** **Ordering Code**	**Strahlstärkegruppierung**[1] (I_F = 1 A, t_p = 10 ms) **Radiant Intensity Grouping**[1] I_e (mW/sr)
SFH 4725S	on request	≥ 320 (typ. 450)

[1] gemessen bei einem Raumwinkel Ω = 0.01 sr / measured at a solid angle of Ω = 0.01 sr

Grenzwerte (T_A = 25 °C)
Maximum Ratings

Bezeichnung **Parameter**	**Symbol** **Symbol**	**Wert** **Value**	**Einheit** **Unit**
Betriebs- und Lagertemperatur Operating and storage temperature range	T_{op} , T_{stg}	– 40 … + 125	°C
Sperrschichttemperatur Junction temperature	T_J	+ 145	°C
Sperrspannung Reverse voltage	V_R	1	V
Vorwärtsgleichstrom Forward current	I_F	1	A
Stoßstrom, t_p = 500 µs, D = 0 Surge current	I_{FSM}	5	A
Leistungsaufnahme Power consumption	P_{tot}	3.4	W
Wärmewiderstand Sperrschicht - Lötstelle Thermal resistance junction - soldering point	R_{thJS}	11	K/W

Kennwerte (T_A = 25 °C)
Characteristics

Bezeichnung **Parameter**	**Symbol** **Symbol**	**Wert** **Value**	**Einheit** **Unit**
Wellenlänge der Strahlung Wavelength at peak emission I_F = 1 A, t_p = 10 ms	λ_{peak}	950	nm
Centroid-Wellenlänge der Strahlung Centroid wavelength I_F = 1 A, t_p = 10 ms	$\lambda_{centroid}$	940	nm
Spektrale Bandbreite bei 50% von I_{max} Spectral bandwidth at 50% of I_{max} I_F = 1 A, t_p = 10 ms	$\Delta\lambda$	37	nm
Abstrahlwinkel Half angle	φ	± 45	Grad deg.
Abmessungen der aktiven Chipfläche Dimension of the active chip area	$L \times B$ $L \times W$	1 × 1	mm²
Schaltzeiten, I_e von 10% auf 90% und von 90% auf 10%, I_F = 5 A, R_L = 50 Ω Switching times, I_e from 10% to 90% and from 90% to 10%, I_F = 5 A, R_L = 50 Ω	t_r / t_f	tbd	ns

Kennwerte (T_A = 25 °C)
Characteristics (cont'd)

Bezeichnung **Parameter**	**Symbol** **Symbol**	**Wert** **Value**	**Einheit** **Unit**
Durchlassspannung Forward voltage I_F = 1 A, t_p = 100 µs I_F = 5 A, t_p = 100 µs	 V_F V_F	 2.8 (< 3.4) 3.5 (< 4.5)	 V V
Gesamtstrahlungsfluss Total radiant flux I_F = 1 A, t_p = 100 µs	Φ_e	935	mW
Temperaturkoeffizient von I_e bzw. Φ_e Temperature coefficient of I_e or Φ_e I_F = 1 A, t_p = 10 ms	TC_I	– 0.3	%/K
Temperaturkoeffizient von V_F Temperature coefficient of V_F I_F = 1 A, t_p = 10 ms	TC_V	– 4	mV/K
Temperaturkoeffizient von λ Temperature coefficient of λ I_F = 1 A, t_p = 10 ms	$TC_{\lambda,\mathrm{centroid}}$	+ 0.3	nm/K

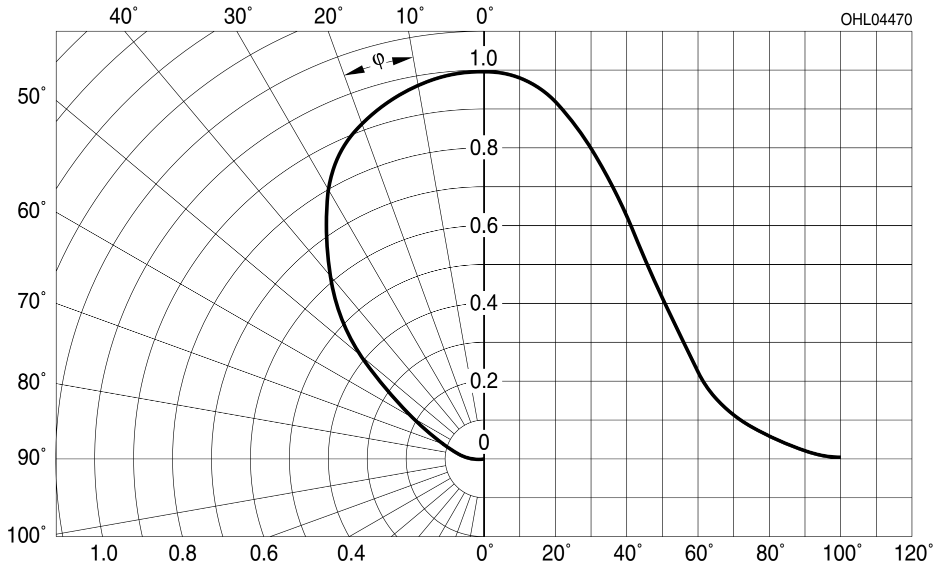
Strahlstärke I_e in Achsrichtung[1]
gemessen bei einem Raumwinkel Ω = 0.01 sr

Radiant Intensity I_e in Axial Direction
at a solid angle of Ω = 0.01 sr

Bezeichnung Parameter	Symbol	Werte Values			Einheit Unit
		-CB	-DA	-DB	
Strahlstärke Radiant intensity I_F = 1 A, t_p = 10 ms	$I_{e\,min}$ $I_{e\,max}$	320 500	400 630	500 800	mW/sr mW/sr

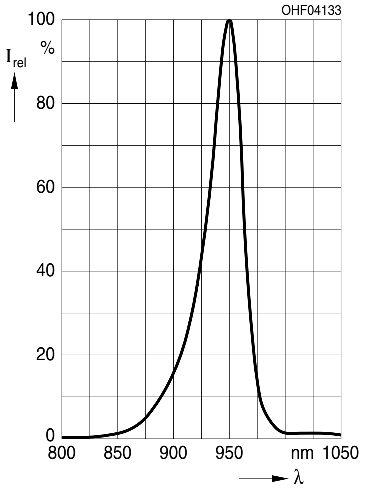
[1] Nur eine Gruppe in einer Verpackungseinheit (Streuung kleiner 1.6:1) /
Only one group in one packing unit (variation lower 1.6:1)

Abstrahlcharakteristik
Radiation Characteristics $I_{rel} = f(\varphi)$



Relative spektrale Emission
Relative Spectral Emission

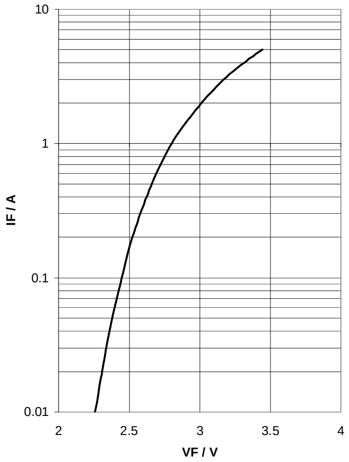
$I_{rel} = f(\lambda)$



Durchlassstrom
Forward Current

$I_F = f(V_F)$

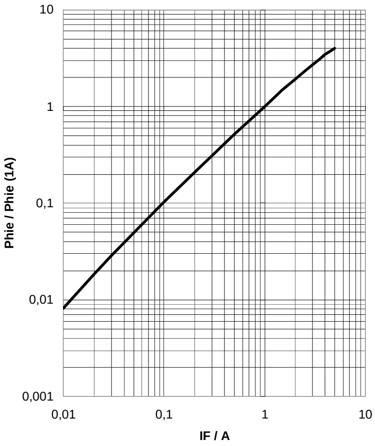
Single pulse, t_p = 100 μs



Relativer Gesamtstrahlungsfluss
Relative Total Radiant Flux

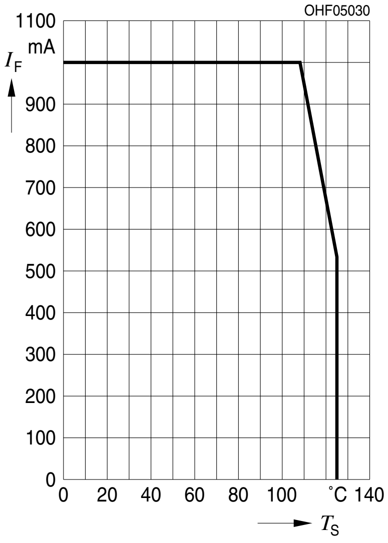
$\Phi_e/\Phi_e(1A) = f(I_F)$

Single pulse, t_p = 100 μs



Max. zulässiger Durchlassstrom
Max. Permissible Forward Current

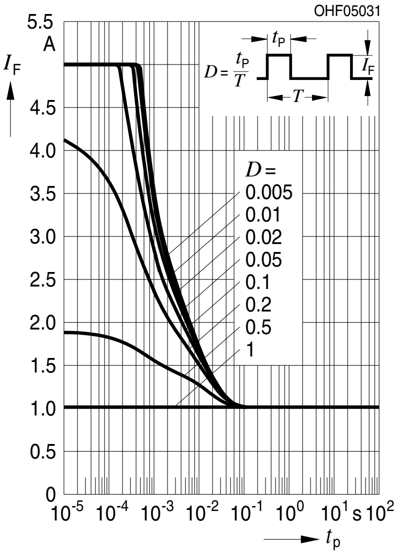
$I_F = f(T_A)$, R_{thJS} = 11 K/W



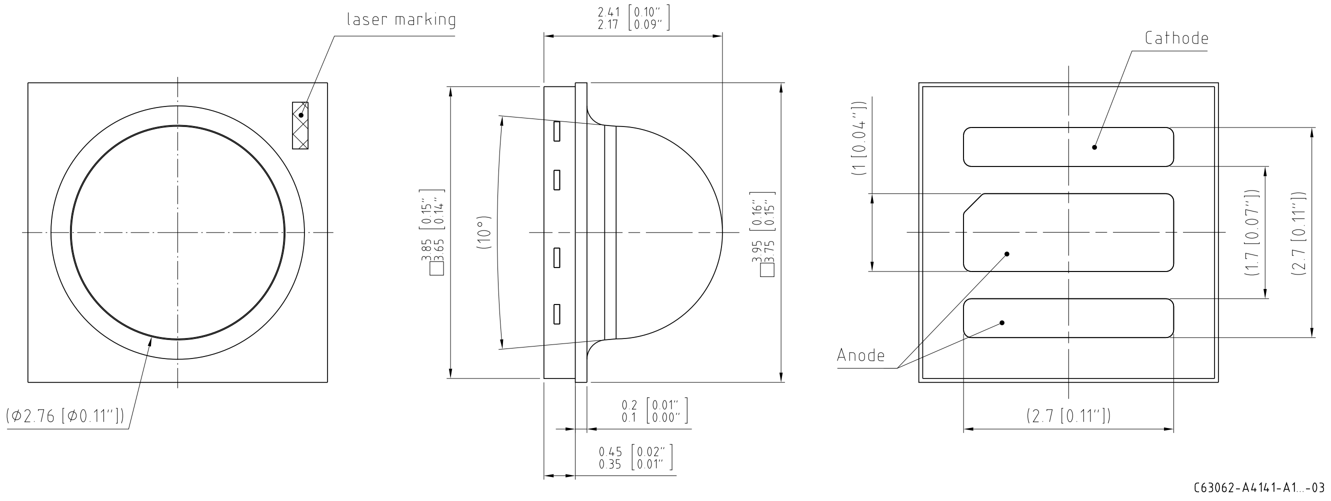
Zulässige Impulsbelastbarkeit
Permissible Pulse Handling

Capability $I_F = f(t_p)$, T_S = 85 °C,

Duty cycle D = parameter



Maßzeichnung[1]
Package Outlines



Note: Die IRED enthält ein ESD-Schutzbauteil, das parallel zum Chip geschaltet ist. / IRED is protected by ESD device which is connected in parallel to chip.

Note: Das Gehäuse ist für Ultraschallreinigung nicht geeignet. / Package is not suitalbe for ultra sonic cleaning.

Korrosionsfestigkeit besser als EN 60068-2-60 (method 4):
mit erweitertem Korrosionstest: 40°C / 90%rh / 15ppm H2S / 336h

Corrosion robustness better than EN 60068-2-60 (method 4):
with enhanced corrosion test: 40°C / 90%rh / 15ppm H2S / 336h

Anodenkennung:	Anodenpad ist abgeschrägt und weist zur Kathode
Anode mark:	Anode pad has chamfered edge, which points to cathode
Gewicht / Approx. weight:	32 mg

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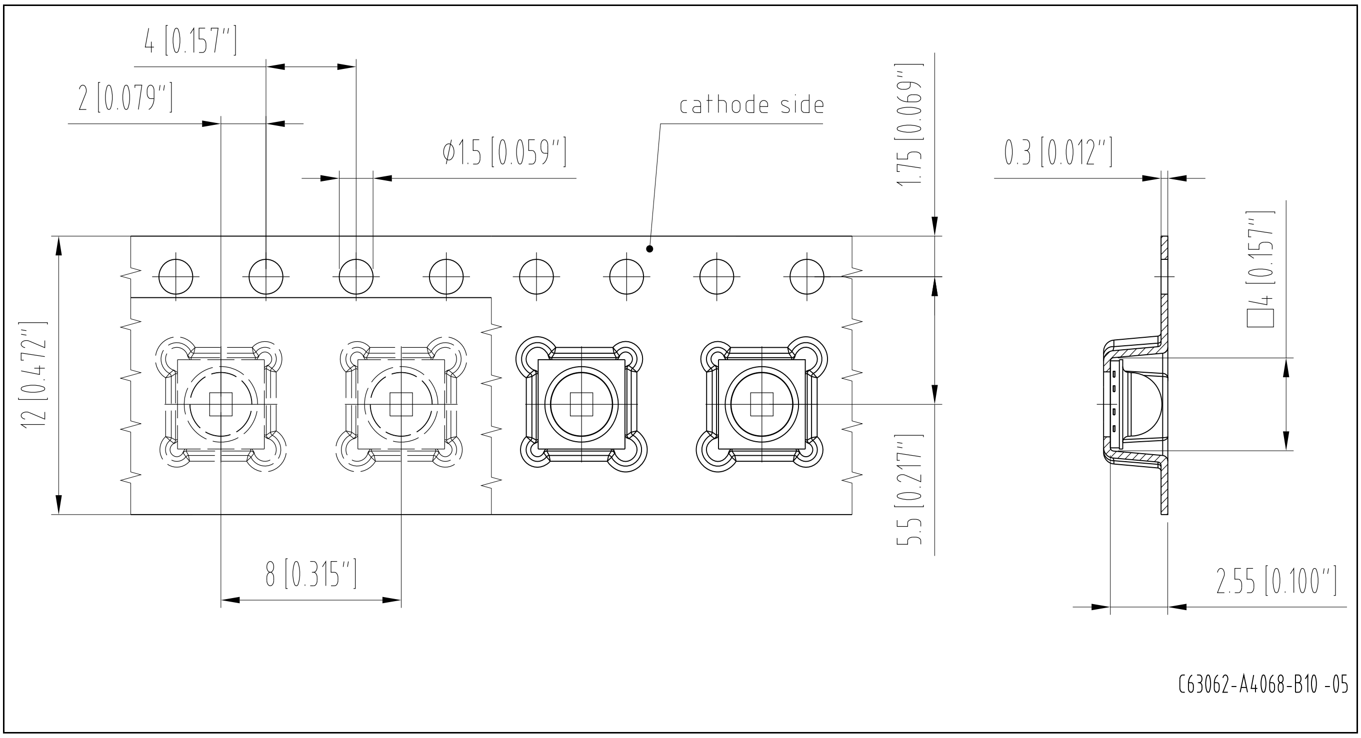
[1] Maße in mm (inch) / Dimensions in mm (inch)

Gurtung / Polarität und Lage[1]
Method of Taping / Polarity and Orientation

Verpackungseinheit 600/Rolle, ø180 mm
Packing unit 600/reel, ø180 mm



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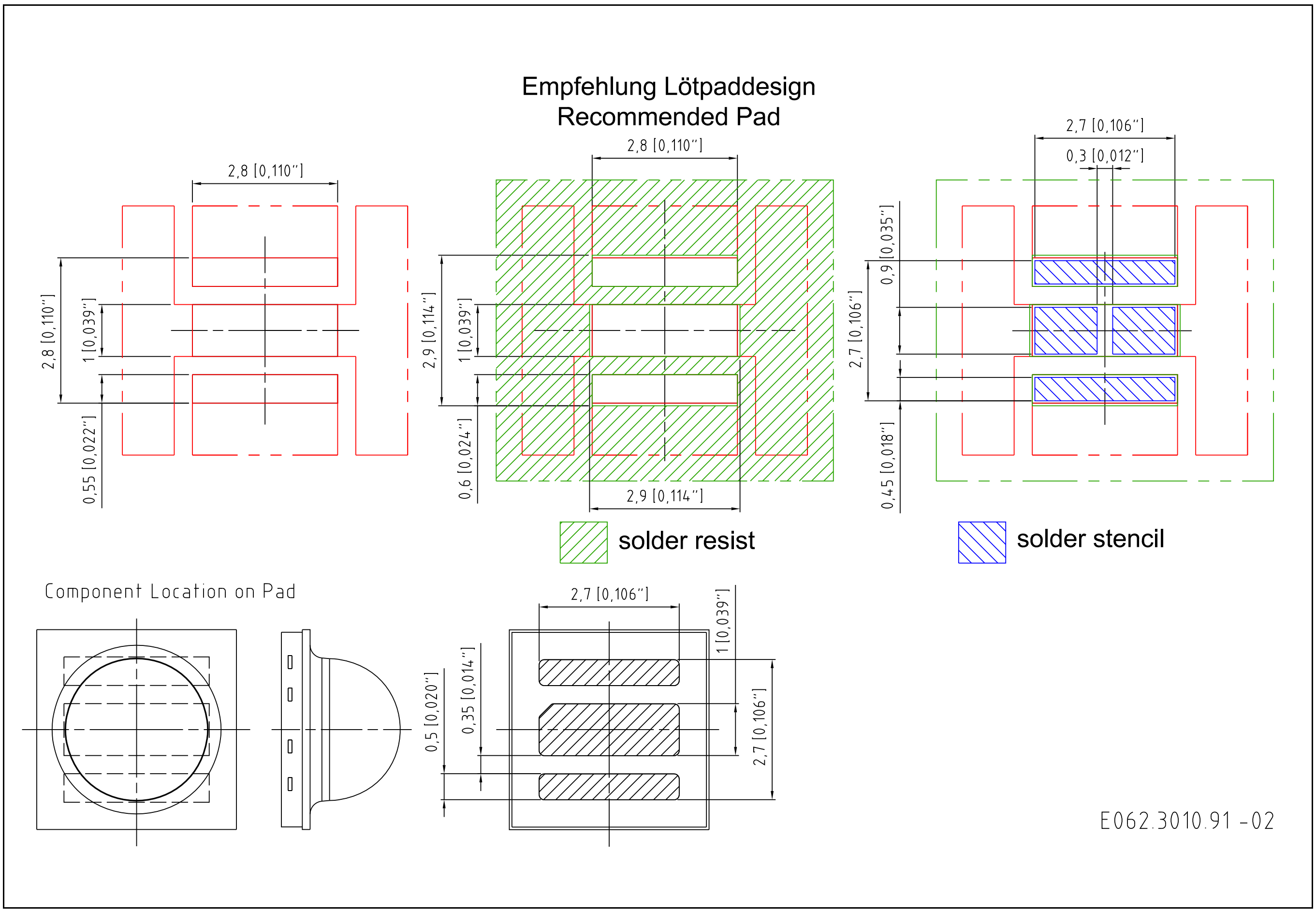
[1] Maße in mm (inch) / Dimensions in mm (inch)

Empfohlenes Lötpaddesign[1]
Recommended Solder Pad Design



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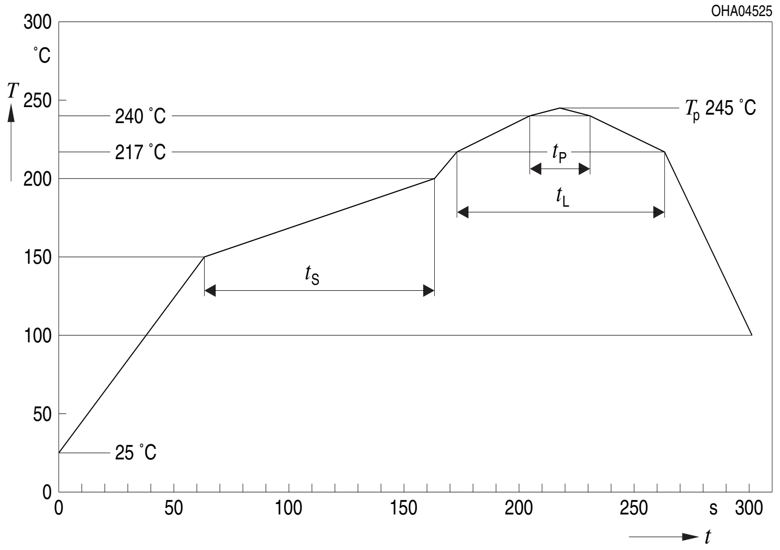
[1] Maße in mm (inch) / Dimensions in mm (inch)

Lötbedingungen
Soldering Conditions

Vorbehandlung nach JEDEC Level 2
Preconditioning acc. to JEDEC Level 2

Reflow Lötprofil für bleifreies Löten
Reflow Soldering Profile for lead free soldering

(nach J-STD-020D.01)
(acc. to J-STD-020D.01)



Profileigenschaften Profile Feature	Bleifreier Aufbau / Pb-Free Assembly (SnAgCu)	
	Empfehlung / Recommendation	**Grenzwerte / Max. Ratings**
Aufheizrate zum Vorwärmen*) / Ramp-up rate to preheat*) 25 °C to 150 °C	2 K / s	3 K / s
Zeit t_s von T_{Smin} bis T_{Smax} / Time t_s from T_{Smin} to T_{Smax} 150 °C to 200 °C	100 s	min. 60 s max. 120 s
Aufheizrate zur Spitzentemperatur*) / Ramp-up rate to peak*) 180 °C to T_P	2 K / s	3 K / s
Liquidustemperatur T_L / Liquidus temperature T_L	217 °C	
Zeit t_L über T_L / Time t_L above T_L	80 s	max. 100 s
Spitzentemperatur T_P / Peak temperature T_P	245 °C	max. 260 °C
Verweilzeit t_P innerhalb des spezifizierten Spitzentemperaturbereichs T_P - 5 K / Time t_P within the specified peak temperature range T_P - 5 K	20 s	min. 10 s max. 30 s
Abkühlrate*) / Ramp-down rate*) T_P to 100 °C	3 K / s	6 K / s maximum
Zeitspanne von 25 °C bis zur Spitzentemperatur / Time from 25 °C to peak temperature		max. 8 min.

Alle Temperaturen beziehen sich auf die Bauteilmitte, jeweils auf der Bauteiloberseite gemessen / All temperatures refer to the center of the package, measured on the top of the package
* Steigungsberechnung $\Delta T/\Delta t$: Δt max. 5 s; erfüllt über den gesamten Temperaturbereich / slope calculation $\Delta T/\Delta t$: Δt max. 5 s; fulfillment for the whole T-range

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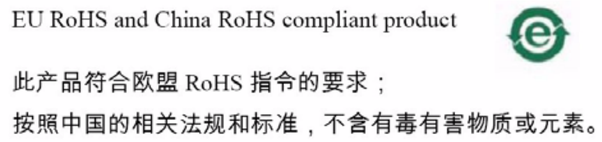

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