Hyper Mini TOPLED®
Hyper-Bright Low Current LED

LS M67K, LO M67K, LY M67K

Besondere Merkmale

- **Gehäusetyp:** weißes SMT-Gehäuse
- **Besonderheit des Bauteils:** kleine Bauform 2,3 mm x 1,3 mm x 1,4 mm
- **Wellenlänge:** 630 nm (super-rot), 606 nm (orange), 587 nm (gelb)
- **Abstrahlwinkel:** Lambertscher Strahler (120°)
- **Technologie:** InGaAlP
- **optischer Wirkungsgrad:** 6 lm/W (gelb), 5 lm/W (super-rot), 9 lm/W (orange)
- **Gruppierungsparameter:** Lichtstärke, Wellenlänge
- **Verarbeitungsmethode:** für alle SMT-Bestücktechniken geeignet
- **Lötmethode:** IR Reflow Löten und Wellenlöten (TTW)
- **Vorbehandlung:** nach JEDEC Level 2
- **Gurtung:** 8-mm Gurt mit 3000/Rolle, ø180 mm oder 12000/Rolle, ø330 mm
- **ESD-Festigkeit:** ESD-sicher bis 2 kV nach EOS/ESD-5.1-1993

Features

- **package:** white SMT package
- **feature of the device:** small package 2.3 mm x 1.3 mm x 1.4 mm
- **wavelength:** 630 nm (super-red), 606 nm (orange), 587 nm (yellow)
- **viewing angle:** Lambertian Emitter (120°)
- **technology:** InGaAlP
- **optical efficiency:** 6 lm/W (yellow), 5 lm/W (super-red), 9 lm/W (orange)
- **grouping parameter:** luminous intensity, wavelength
- **assembly methods:** suitable for all SMT assembly methods
- **soldering methods:** IR reflow soldering and TTW soldering
- **preconditioning:** acc. to JEDEC Level 2
- **taping:** 8-mm tape with 3000/reel, ø180 mm or 12000/reel, ø330 mm
- **ESD-withstand voltage:** up to 2 kV acc. to EOS/ESD-5.1-1993

Anwendungen

- Informationsanzeigen im Innenbereich
- optischer Indikator
- Einkopplung in Lichtleiter
- Hinterleuchtung (LCD, Schalter, Tasten, Displays, Werbebeleuchtung, Allgemeinbeleuchtung)
- Innenbeleuchtung im Automobilbereich (z.B. Instrumentenbeleuchtung, u.ä.)

Applications

- indoor displays
- optical indicators
- coupling into light guides
- backlighting (LCD, switches, keys, displays, illuminated advertising, general lighting)
- interior automotive lighting (e.g. dashboard backlighting, etc.)

Typ Type	Emissions-farbe Color of Emission	Farbe der Lichtaustritts-fläche Color of the Light Emitting Area	Lichtstärke Luminous Intensity I_F = 2 mA I_V (mcd)	Lichtstrom Luminous Flux I_F = 2 mA Φ_V (mlm)	Bestellnummer Ordering Code
LS M67K-G2H2-1 LS M67K-H2K1-1	super-red	colorless clear	2.24 … 4.50 3.55 … 9.00	10 (typ.) 18 (typ.	Q65110A0314 Q65110A0332
LO M67K-J1K1-24 LO M67K-K1L2-24	orange	colorless clear	4.50 … 9.00 7.10 … 18.00	20 (typ.) 35 (typ.)	Q65110A0308 Q65110A0309
LY M67K-H2J2-26 LY M67K-J2L1-26	yellow	colorless clear	3.55 … 7.10 5.60 … 14.00	16 (typ.) 30 (typ.)	Q65110A0298 Q65110A0292

*Anm.: -1 gesamter Farbbereich (siehe **Seite 4**)*
*-24 gesamter Farbbereich, Lieferung in Einzelgruppen (siehe **Seite 5**)*
*-26 gesamter Farbbereich, Lieferung in Einzelgruppen (siehe **Seite 5**)*

Die Standardlieferform von Serientypen beinhaltet eine untere bzw. eine obere Familiengruppe, die aus nur 3 bzw. 4 Halbgruppen besteht. Einzelne Halbgruppen sind nicht erhältlich.
In einer Verpackungseinheit / Gurt ist immer nur eine Halbgruppe enthalten.

*Note: -1 Total color tolerance range (please see **page 4**)*
*-24 Total color tolerance range, delivery in single groups (please see **page 5**)*
*-26 Total color tolerance range, delivery in single groups (please see **page 5**)*

The standard shipping format for serial types includes a lower or upper family group of 3 or 4 individual groups. Individual half groups are not available.
No packing unit / tape ever contains more than one luminous intensity half group.

Vergleichstabelle für 10 mA
Correllation Table for 10 mA

Typ Type I_F = 2 mA	Emissions-farbe Color of Emission	Lichtstärke Luminous Intensity I_F = 2 mA I_V (mcd)		Lichtstärke Luminous Intensity I_F = 10 mA I_V (mcd)	Lichtstrom Luminous Flux I_F = 10 mA Φ_V (mlm)
LS M67K-G2H2-1 LS M67K-H2K1-1	super-red	2.24 … 4.50 3.55 … 9.00	⇒	17 (typ.) 30 (typ.	50 (typ.) 90 (typ.
LO M67K-J1K1-24 LO M67K-K1L2-24	orange	4.50 … 9.00 7.10 … 18.00	⇒	30 (typ.) 55 (typ.)	90 (typ.) 165 (typ.)
LY M67K-H2J2-26 LY M67K-J2L1-26	yellow	3.55 … 7.10 5.60 … 14.00	⇒	16 (typ.) 30 (typ.)	48 (typ.) 90 (typ.)

*Siehe auch Grafik auch **Seite 7** / Please see also graph on **page 7***

Grenzwerte
Maximum Ratings

Bezeichnung Parameter	Symbol Symbol	Werte Values		Einheit Unit
		LS, LO	LY	
Betriebstemperatur Operating temperature range	T_{op}	– 40 … + 100		°C
Lagertemperatur Storage temperature range	T_{stg}	– 40 … + 100		°C
Sperrschichttemperatur Junction temperature	T_j	+ 125		°C
Durchlassstrom Forward current	I_F	15		mA
Stoßstrom Surge current $t \leq 10$ µs, $D = 0.005$	I_{FM}	100		mA
Sperrspannung[1)] Reverse voltage	V_R	12		V
Leistungsaufnahme Power consumption $T_A \leq 25$ °C	P_{tot}	40		mW
Wärmewiderstand Thermal resistance Sperrschicht/Umgebung Junction/ambient Sperrschicht/Lötpad Junction/solder point Montage auf PC-Board FR 4 (Padgröße ≥ 5 mm²) mounted on PC board FR 4 (pad size ≥ 5 mm²)	 $R_{th\ JA}$ $R_{th\ JS}$	 530 280		 K/W K/W

[1)] für kurzzeitigen Betrieb geeignet / suitable for short term application

Kennwerte (T_A = 25 °C)
Characteristics

Bezeichnung **Parameter**		**Symbol** **Symbol**	**Werte** **Values**			**Einheit** **Unit**
			LS	**LO**	**LY**	
Wellenlänge des emittierten Lichtes Wavelength at peak emission I_F = 2 mA	(typ.)	λ_{peak}	643	610	591	nm
Dominantwellenlänge [1] Dominant wavelength I_F = 2 mA	(typ.)	λ_{dom}	630 ± 6	606 –6/+3	587 –7/+8	nm
Spektrale Bandbreite bei 50 % $I_{rel\ max}$ Spectral bandwidth at 50 % $I_{rel\ max}$ I_F = 2 mA	(typ.)	$\Delta\lambda$	16	16	15	nm
Abstrahlwinkel bei 50 % I_V (Vollwinkel) Viewing angle at 50 % I_V	(typ.)	2φ	120	120	120	Grad deg.
Durchlassspannung [2] Forward voltage I_F = 2 mA	(typ.) (max.)	V_F V_F	1.8 2.2	1.8 2.2	1.8 2.2	V V
Sperrstrom Reverse current V_R = 12 V	(typ.) (max.)	I_R I_R	0.01 10	0.01 10	0.01 10	µA µA
Temperaturkoeffizient von λ_{peak} Temperature coefficient of λ_{peak} I_F = 2 mA; –10°C ≤ T ≤ 100°C	(typ.)	$TC_{\lambda peak}$	0.14	0.14	0.12	nm/K
Temperaturkoeffizient von λ_{dom} Temperature coefficient of λ_{dom} I_F = 2 mA; –10°C ≤ T ≤ 100°C	(typ.)	$TC_{\lambda dom}$	0.05	0.09	0.09	nm/K
Temperaturkoeffizient von V_F Temperature coefficient of V_F I_F = 2 mA; –10°C ≤ T ≤ 100°C	(typ.)	TC_V	– 1.8	– 1.5	– 2.1	mV/K
Optischer Wirkungsgrad Optical efficiency I_F = 2 mA	(typ.)	η_{opt}	5	9	6	lm/W

[1] Wellenlängengruppen werden mit einer Stromeinprägedauer von 25 ms und einer Genauigkeit von ±1 nm ermittelt.
Wavelength groups are tested at a current pulse duration of 25 ms and a tolerance of ±1 nm.

[2] Spannungswerte werden mit einer Stromeinprägedauer von 1 ms und einer Genauigkeit von ±0,1 V ermittelt.
Volltages are tested at a current pulse duration of 1 ms and a tolerance of ±0.1 V.

[1] **Wellenlängengruppen / Wavelength groups**

Gruppe Group	yellow		orange		Einheit Unit
	min.	max.	min.	max.	
2	580	583	600	603	nm
3	583	586	603	606	nm
4	586	589	606	609	nm
5	589	592			nm
6	592	595			nm

Helligkeits-Gruppierungsschema
Luminous Intensity Groups

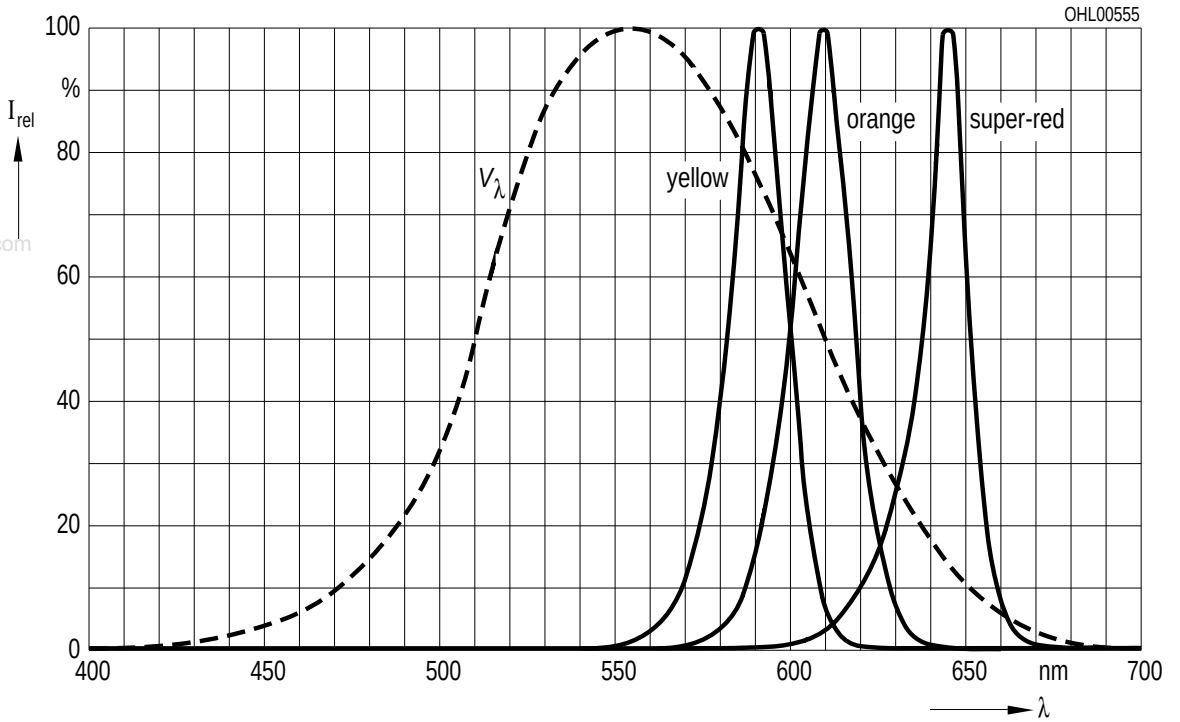
Lichtgruppe Luminous Intensity Group	Lichtstärke Luminous Intensity I_V (mcd)	Lichtstrom Luminous Flux Φ_V (mlm)
G2	2.24 … 2.80	8 (typ.)
H1	2.80 … 3.55	10 (typ.)
H2	3.55 … 4.50	12 (typ.)
J1	4.50 … 5.60	15 (typ.)
J2	5.60 … 7.10	19 (typ.)
K1	7.10 … 9.00	24 (typ.)
K2	9.00 …11.20	30 (typ.)
L1	11.20 …14.00	40 (typ.)
L2	14.00 …18.00	50 (typ.)

Helligkeitswerte werden mit einer Stromeinprägedauer von 25 ms und einer Genauigkeit von ±11 % ermittelt.
Luminous intensity is tested at a current pulse duration of 25 ms and a tolerance of ±11 %.

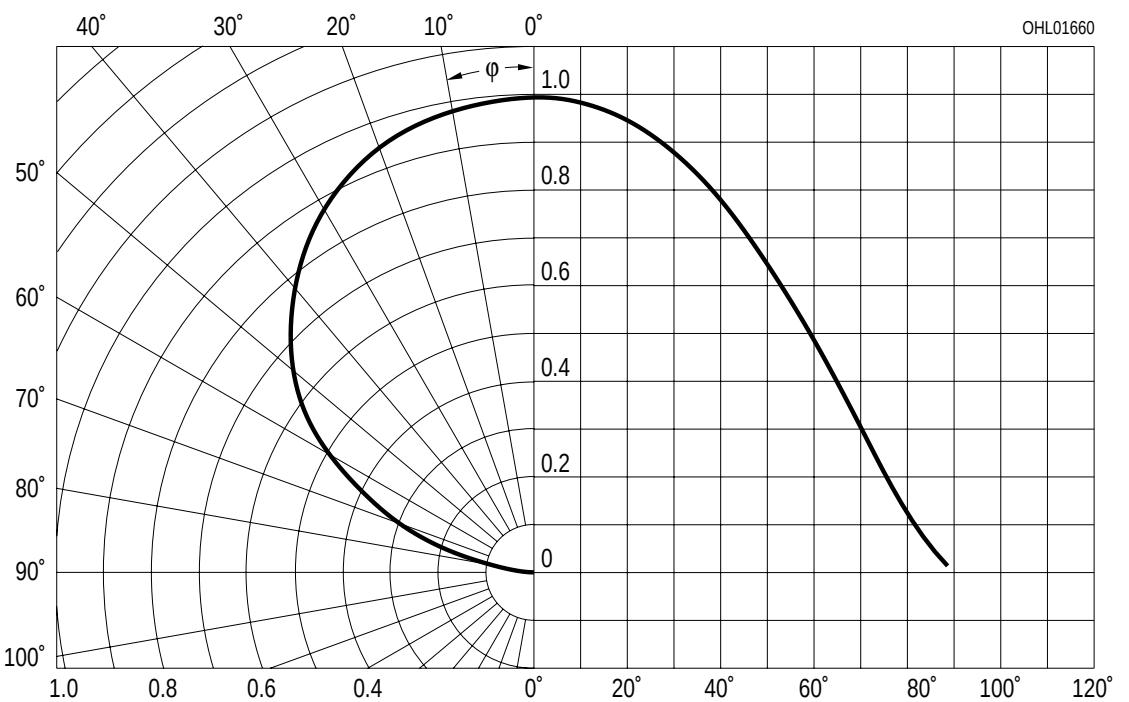
Gruppenbezeichnung auf Etikett
Group Name on Label
Beispiel: K2-3
Example: K2-3

Lichtgruppe Luminous Intensity Group	Halbgruppe Half Group	Wellenlänge Wavelength
K	2	3

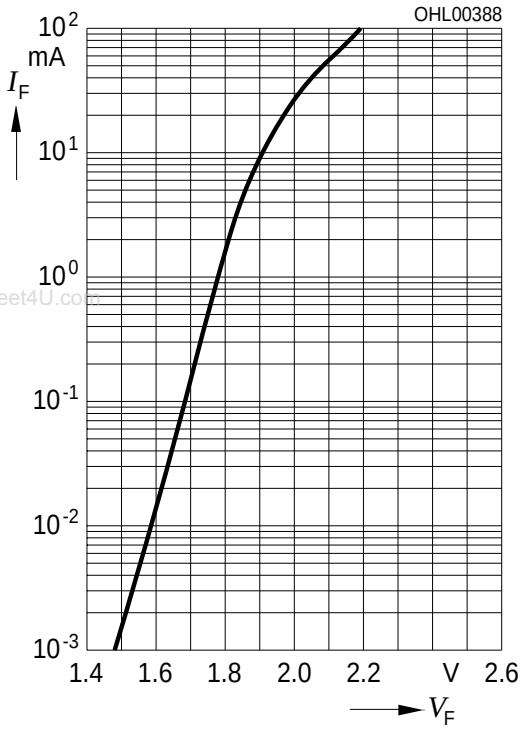
Relative spektrale Emission $I_{rel} = f(\lambda)$, T_A = 25 °C, I_F = 2 mA
Relative Spectral Emission
V(λ) = spektrale Augenempfindlichkeit
Standard eye response curve



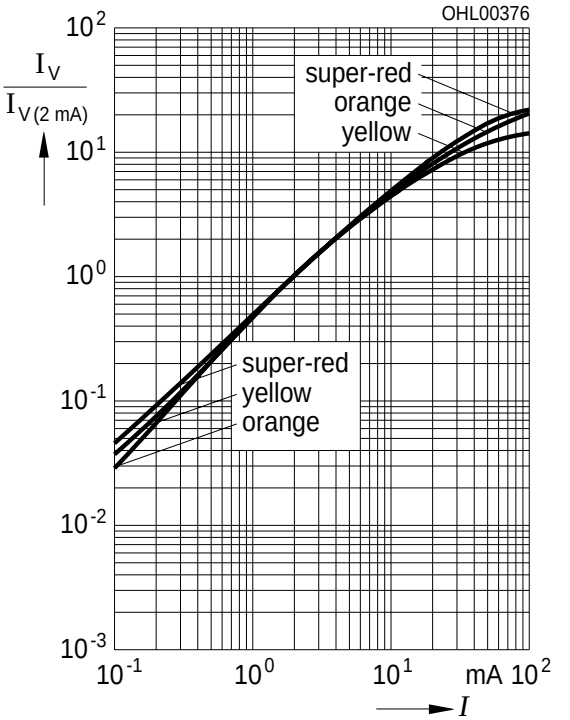
Abstrahlcharakteristik $I_{rel} = f(\varphi)$
Radiation Characteristic



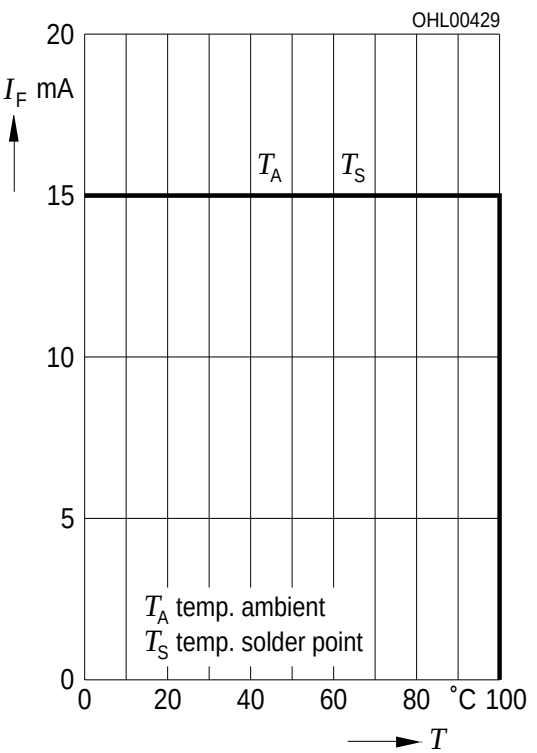
Durchlassstrom $I_F = f(V_F)$
Forward Current
T_A = 25 °C



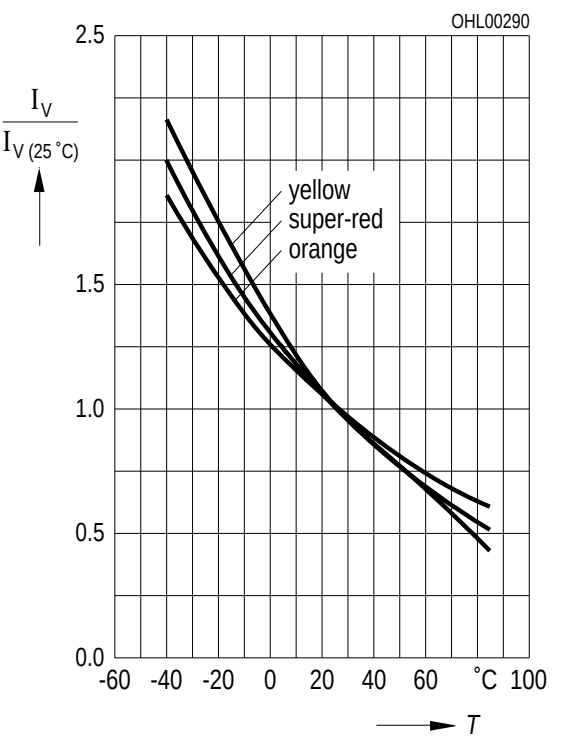
Relative Lichtstärke $I_V/I_{V(2\ mA)} = f(I_F)$
Relative Luminous Intensity
T_A = 25 °C



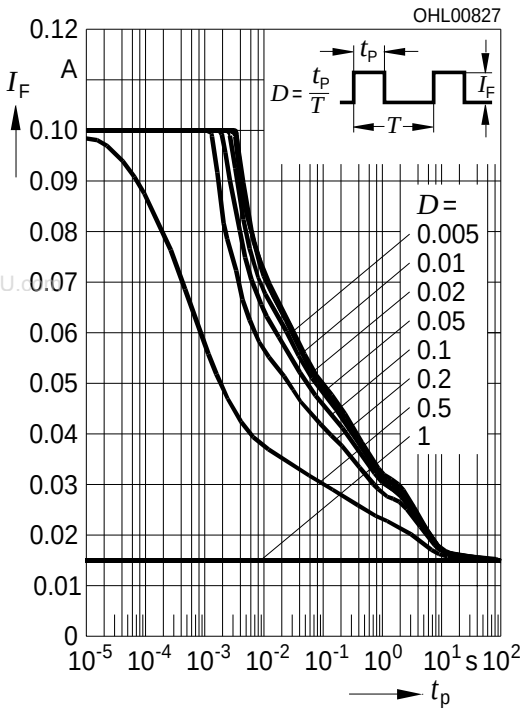
Maximal zulässiger Durchlassstrom $I_F = f(T)$
Max. Permissible Forward Current



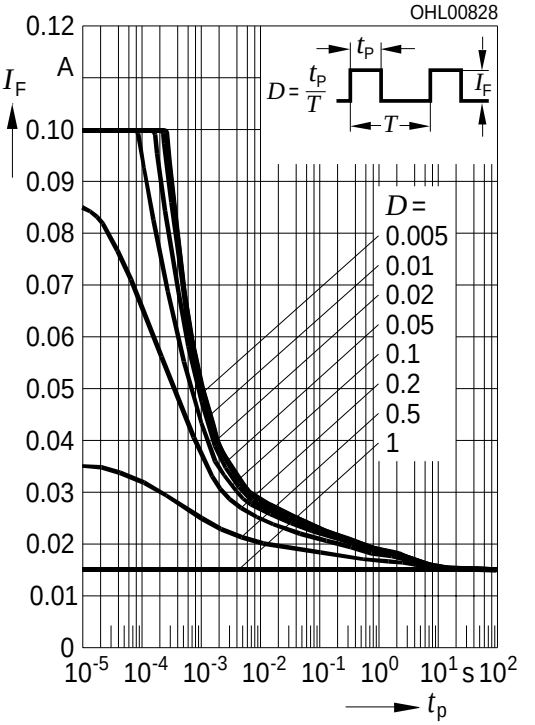
Relative Lichtstärke $I_V/I_{V(25\ °C)} = f(T_A)$
Relative Luminous Intensity I_F = 2 mA



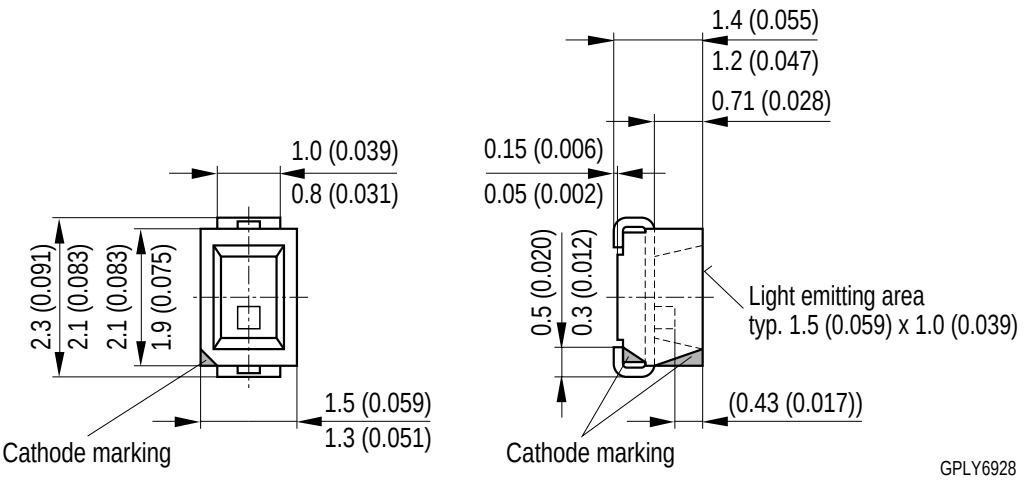
Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability
Duty cycle D = parameter, T_A = 25 °C



Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability
Duty cycle D = parameter, T_A = 85 °C



Maßzeichnung
Package Outlines

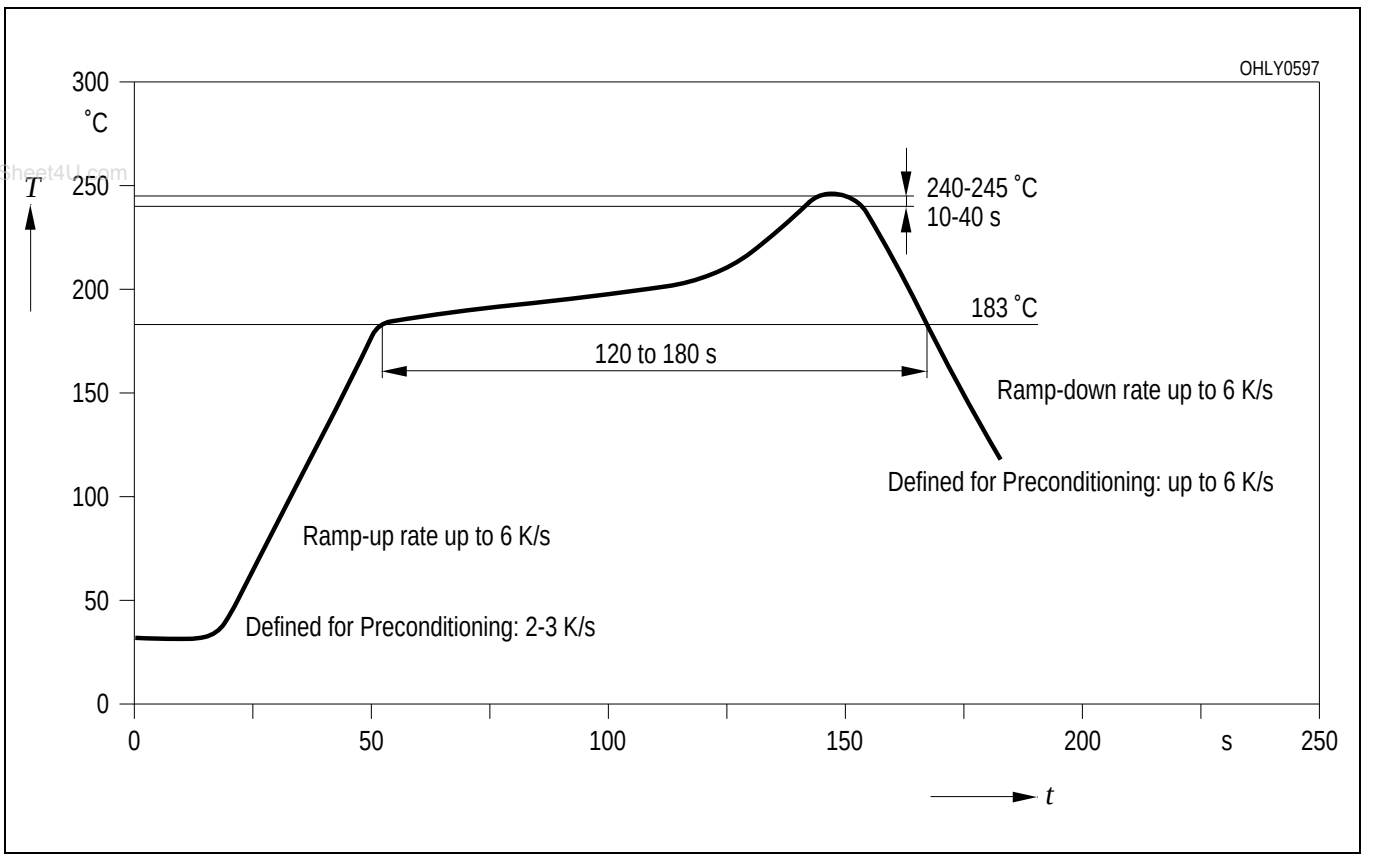


Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

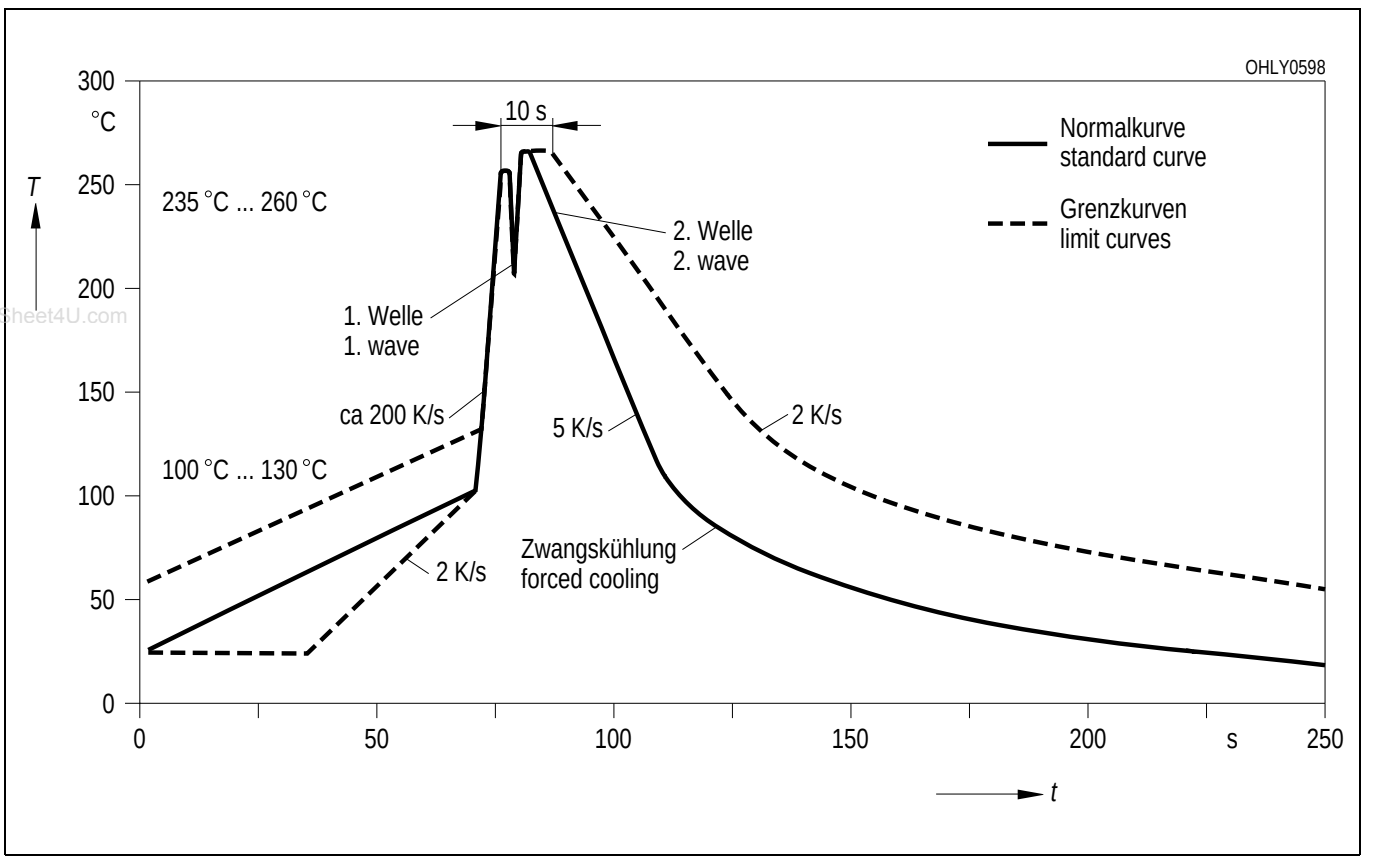
Kathodenkennung: abgeschrägte Ecke
Cathode mark: bevelled edge
Gewicht / Approx. weight: 10 mg

Lötbedingungen Vorbehandlung nach JEDEC Level 2
Soldering Conditions Preconditioning acc. to JEDEC Level 2

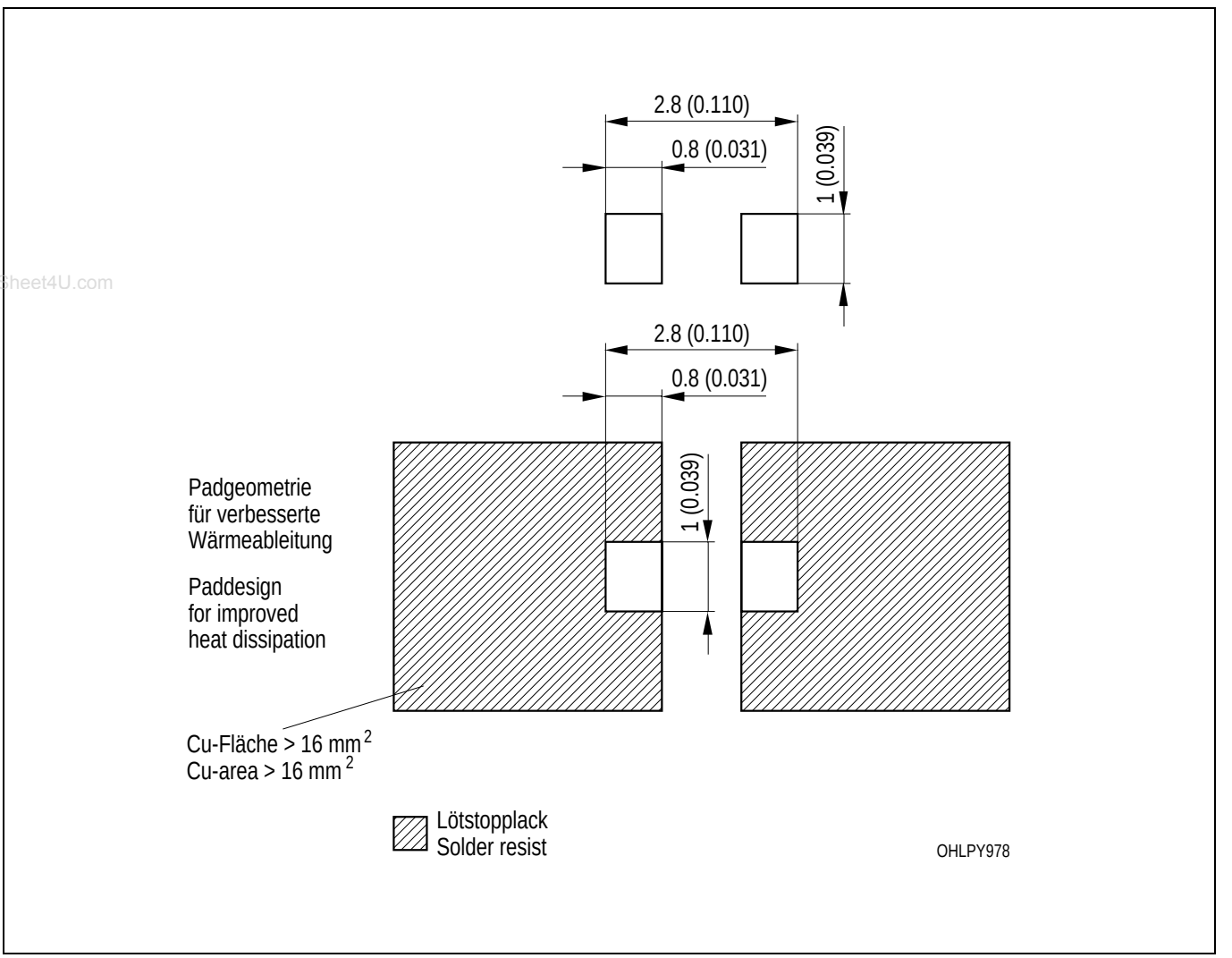
IR-Reflow Lötprofil (nach IPC 9501)
IR Reflow Soldering Profile (acc. to IPC 9501)



Wellenlöten (TTW) (nach CECC 00802)
TTW Soldering (acc. to CECC 00802)



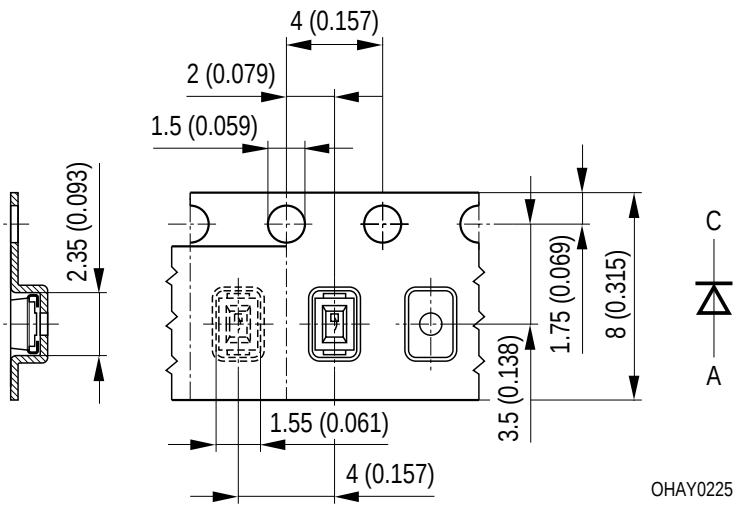
Empfohlenes Lötpaddesign IR Reflow Löten
Recommended Solder Pad IR Reflow Soldering



Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch)
Gehäuse hält TTW-Löthitze aus / Package able to withstand TTW-soldering heat

Gurtung / Polarität und Lage
Verpackungseinheit 3000/Rolle, ø180 mm
oder 12000/Rolle, ø330 mm

Method of Taping / Polarity and Orientation
Packing unit 3000/reel, ø180 mm
or 12000/reel, ø330 mm



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

Revision History: 2003-02-24		Date of change
Previous Version: -		
Page	**Subjects (major changes since last revision)**	

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Attention please!
The information describes the type of component and shall not be considered as assured characteristics.
All typical data and graphs are basing on representative samples, but don't represent the production range. If requested, e.g. because of technical improvements, these typ. data will be changed without any further notice.
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.
If printed or downloaded, please find the latest version in the Internet.
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 [1] may only be used in life-support devices or systems [2] with the express written approval of OSRAM OS.
[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 the effectiveness of that device or system.
[2] 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.