Hyper Multi TOPLED®
Hyper-Bright LED

LHGB T686

Vorläufige Daten / Preliminary Data

Besondere Merkmale

- **Gehäusetyp:** weißes P-LCC-4 Gehäuse; Kontrasterhöhung durch schwarze Oberfläche (RGB-Displays)
- **Besonderheit des Bauteils:** additive Farbmischung durch unabhängige Ansteuerung aller Chips
- **Wellenlänge:** 645 nm (hyper-rot), 570 nm (grün), 465 nm (blau)
- **Abstrahlwinkel:** Lambertscher Strahler (120°)
- **Technologie:** AlGaAs (hyper-rot), GaP (grün), GaN (blau)
- **optischer Wirkungsgrad:** 3 lm/W (hyper-rot), 2,5 lm/W (grün),1 lm/W (blau)
- **Gruppierungsparameter:** Lichtstärke
- **Verarbeitungsmethode:** für alle SMT-Bestücktechniken geeignet
- **Lötmethode:** IR Reflow Löten und Wellenlöten (TTW)
- **Vorbehandlung:** nach JEDEC Level 2
- **Gurtung:** 8 mm Gurt mit 8000/Rolle, ø330 mm

Features

- **package:** white P-LCC-4 package; higher contrast by a black surface (RGB-Displays)
- **feature of the device:** additive mixture of color stimuli by independent driving of each chip
- **wavelength:** 645 nm (hyper-red), 570 nm (green), 465 nm (blue)
- **viewing angle:** Lambertian Emitter (120°)
- **technology:** AlGaAs (hyper-red), GaP (green), GaN (blue)
- **optical efficiency:** 3 lm/W (hyper-red), 2.5 lm/W (green),1 lm/W (blue)
- **grouping parameter:** luminous intensity
- **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 8000/reel, ø330 mm

Anwendungen

- Anzeigen im Innenbereich (z.B. Laufschriftanzeigen)
- Leuchtdiodenchips getrennt ansteuerbar
- Vollfarbdisplays bzw. RGB-Displays
- Hinterleuchtung (LCD, Schalter, Tasten, Displays, Werbebeleuchtung, Allgemeinbeleuchtung)
- Einkopplung in Lichtleiter
- Für automobil Anwendungen nicht geeignet

Applications

- indoor displays (e.g. light writing displays)
- LED chips can be controlled separately
- full color displays, RGB-Displays
- backlighting (LCD, switches, keys, displays, illuminated advertising, general lighting)
- coupling into light guides
- not suitable for automotive applications

Typ Type	Emissions-farbe Color of Emission	Farbe der Lichtaustritts-fläche Color of the Light Emitting Area	Lichtstärke Luminous Intensity I_F = 10 mA I_V (mcd)			Bestell-nummer Ordering Code
			hyper-red	green	blue	
LHGB T686	hyper-red	colorless clear	7.1 ...18.0	7.1 ...18.0	4.5 ... 11.2	Q62703-Q5771
K+K+K	green	and	7.1 ...11.2	7.1 ...11.2	7.1 ... 11.2	
K+K+J	blue	black painted	7.1 ...11.2	7.1 ...11.2	4.5 ... 7.1	
K+L+K		package	7.1 ...11.2	11.2 ...18.0	7.1 ... 11.2	
K+L+J		surface	7.1 ...11.2	11.2 ...18.0	4.5 ... 7.1	
L+K+K			11.2 ...18.0	7.1 ...11.2	7.1 ... 11.2	
L+K+J			11.2 ...18.0	7.1 ...11.2	4.5 ... 7.1	
L+L+K			11.2 ...18.0	11.2 ...18.0	7.1 ... 11.2	
L+L+J			11.2 ...18.0	11.2 ...18.0	4.5 ... 7.1	

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 %.

Anm.: Die Standardlieferform von Serientypen beinhaltet eine Familiengruppe. Einzelne Gruppen sind nicht erhältlich.
In einer Verpackungseinheit / Gurt ist immer nur eine Gruppe pro Farbe enthalten.

Note: The standard shipping format for serial types includes a family group. Individual groups are not available.
No packing unit / tape ever contains more than one luminous intensity group per color.

Grenzwerte
Maximum Ratings

Bezeichnung **Parameter**	**Symbol** **Symbol**	**Werte** **Values**			**Einheit** **Unit**
		LH	**LG**	**LB**	
Betriebstemperatur Operating temperature range	T_{op}	– 40 … + 100			°C
Lagertemperatur Storage temperature range	T_{stg}	– 40 … + 100			°C
Sperrschichttemperatur Junction temperature	T_j	+ 100			°C
Durchlassstrom Forward current	I_F	30	30	20	mA
Stoßstrom Surge current t_p = 10 µs, D = 0.005	I_{FM}	0.5	0.5	0.2	A
Sperrspannung Reverse voltage	V_R	3	5	5	V
Leistungsaufnahme Power consumption	P_{tot}	90	95	90	mW
Wärmewiderstand Thermal resistance					
Sperrschicht / Umgebung 1 chip on	$R_{th\ JA}$	480	480	580	K/W
Junction / ambient 3 chips on	$R_{th\ JA}$	680	770	820	K/W
Sperrschicht / Lötpad 1 chip on	$R_{th\ JS}$	260	260	360	K/W
Junction / solder point 3 chips on	$R_{th\ JS}$	370	420	510	K/W
Montage auf PC-Board FR 4 (Padgröße ≥ 16 mm²) mounted on PC board FR 4 (pad size ≥ 16 mm²)					

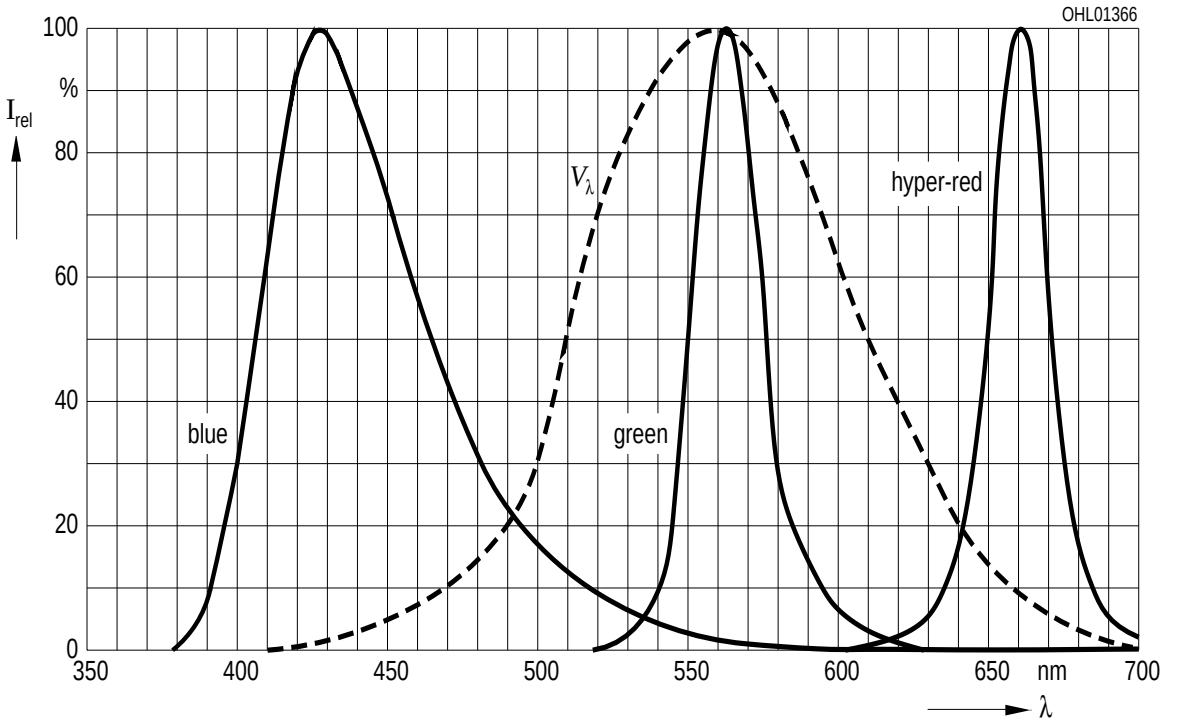
Kennwerte (T_A = 25 °C)
Characteristics

Bezeichnung **Parameter**		**Symbol** **Symbol**	**Werte** **Values**			**Einheit** **Unit**
			LH	**LG**	**LB**	
Wellenlänge des emittierten Lichtes Wavelength at peak emission I_F = 10 mA	(typ.)	λ_{peak}	660	572	428	nm
Dominantwellenlänge [1] Dominant wavelength I_F = 10 mA	(typ.)	λ_{dom}	645 ± 9	570 ± 6	465 ± 3	nm
Spektrale Bandbreite bei 50 % $I_{rel\ max}$ Spectral bandwidth at 50 % $I_{rel\ max}$ I_F = 10 mA	(typ.)	$\Delta\lambda$	22	25	60	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 = 10 mA	(typ.) (max.)	V_F V_F	1.75 2.5	2.0 2.5	3.5 4.1	V V
Sperrstrom Reverse current V_R = 5 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 = 10 mA; –10°C ≤ T ≤ 100°C	(typ.)	$TC_{\lambda peak}$	0.28	0.11	0.004	nm/K
Temperaturkoeffizient von λ_{dom} Temperature coefficient of λ_{dom} I_F = 10 mA; –10°C ≤ T ≤ 100°C	(typ.)	$TC_{\lambda dom}$	0.05	0.07	0.03	nm/K
Temperaturkoeffizient von V_F Temperature coefficient of V_F I_F = 10 mA; –10°C ≤ T ≤ 100°C	(typ.)	TC_V	– 2.5	– 1.4	– 3.1	mV/K
Optischer Wirkungsgrad Optical efficiency I_F = 10 mA	(typ.)	η_{opt}	3	2.5	1	lm/W

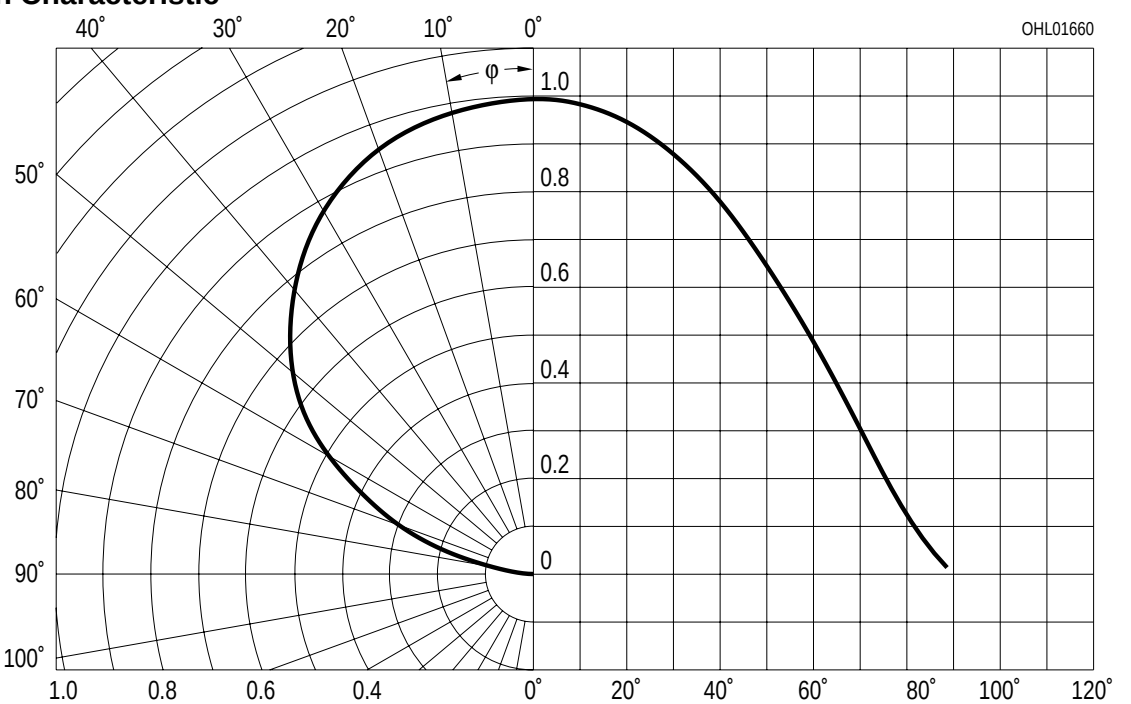
[1] Wellenlängen werden mit einer Stromeinprägedauer von 25 ms und einer Genauigkeit von ±1 nm ermittelt.
Wavelengths are tested at a current pulse duration of 25 ms and a tolerance of ±1 nm.

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

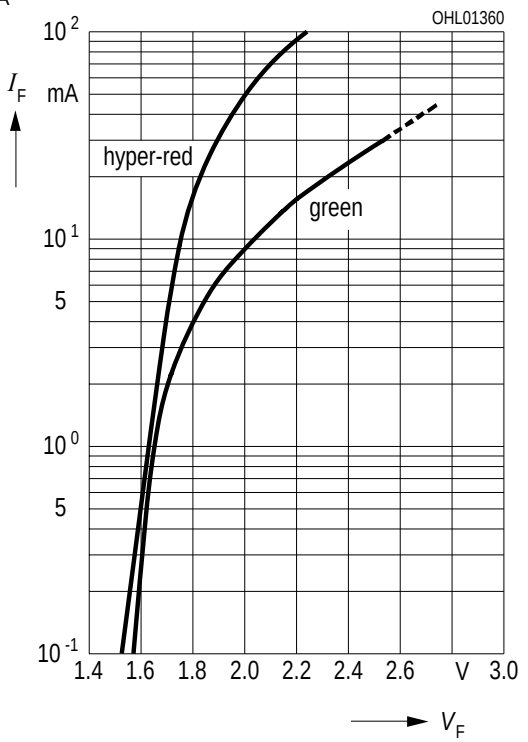
Relative spektrale Emission $I_{rel} = f(\lambda)$, T_A = 25 °C, I_F = 10 mA
Relative Spectral Emission
V(λ) = spektrale Augenempfindlichkeit
Standard eye response curve



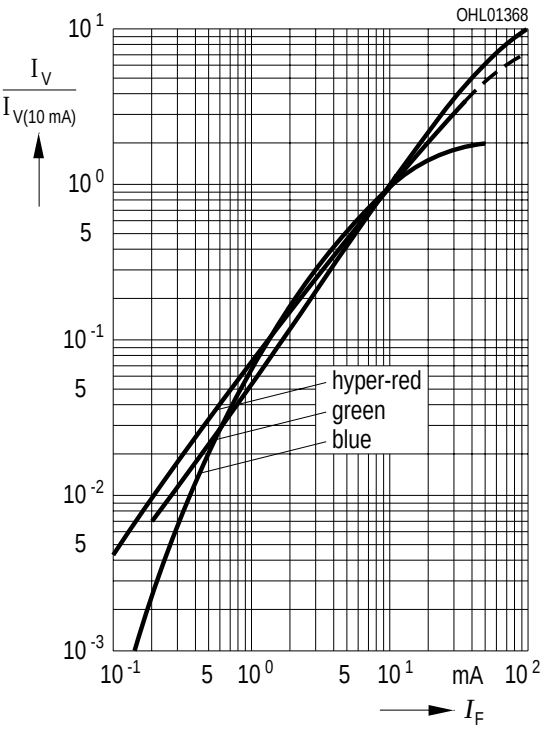
Abstrahlcharakteristik $I_{rel} = f(\varphi)$
Radiation Characteristic



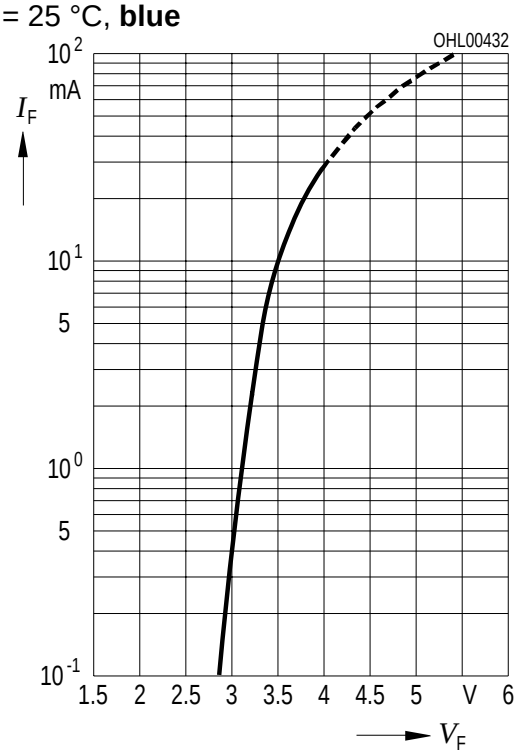
Durchlassstrom $I_F = f(V_F)$
Forward Current
T_A = 25 °C



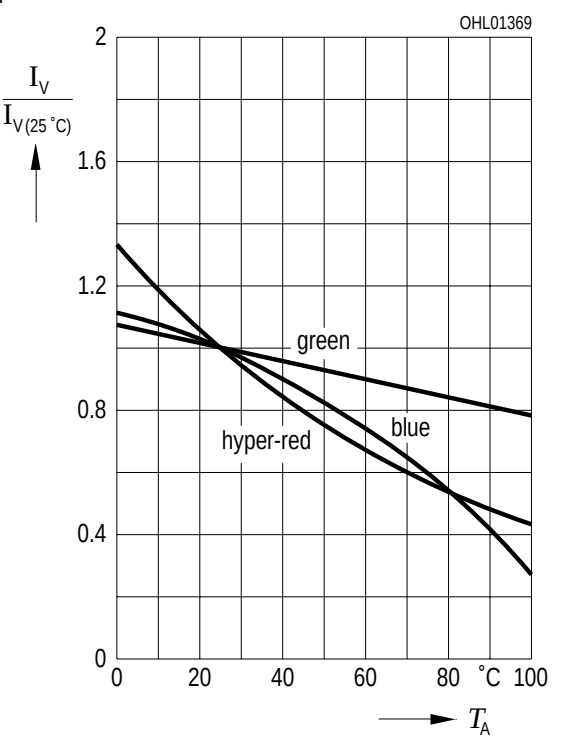
Relative Lichtstärke $I_V/I_{V(10\ mA)} = f(I_F)$
Relative Luminous Intensity
T_A = 25 °C



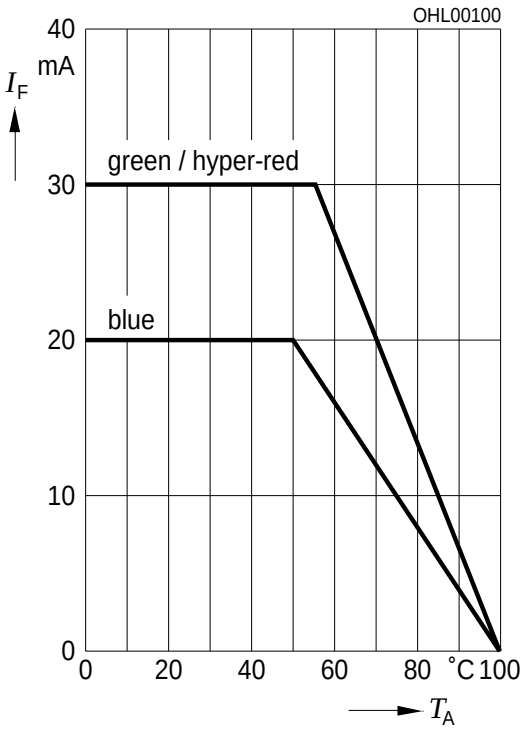
Durchlassstrom $I_F = f(V_F)$
Forward Current
T_A = 25 °C, **blue**



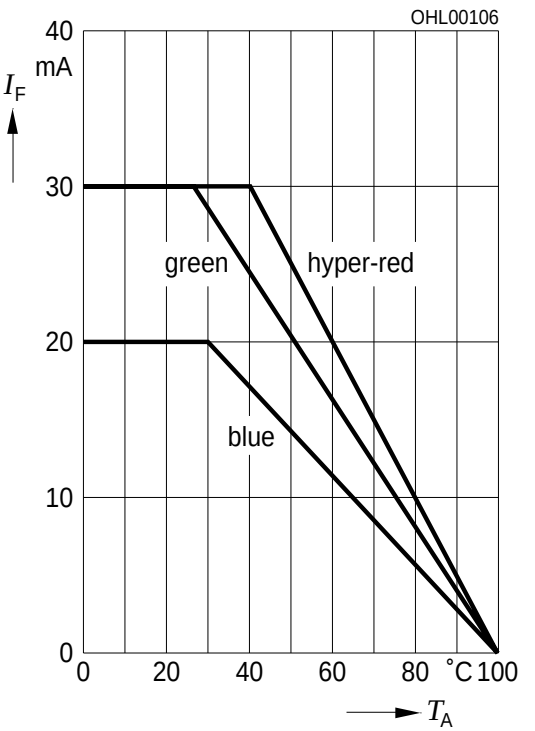
Relative Lichtstärke $I_V/I_{V(25\ °C)} = f(T_A)$
Relative Luminous Intensity
I_F = 10 mA



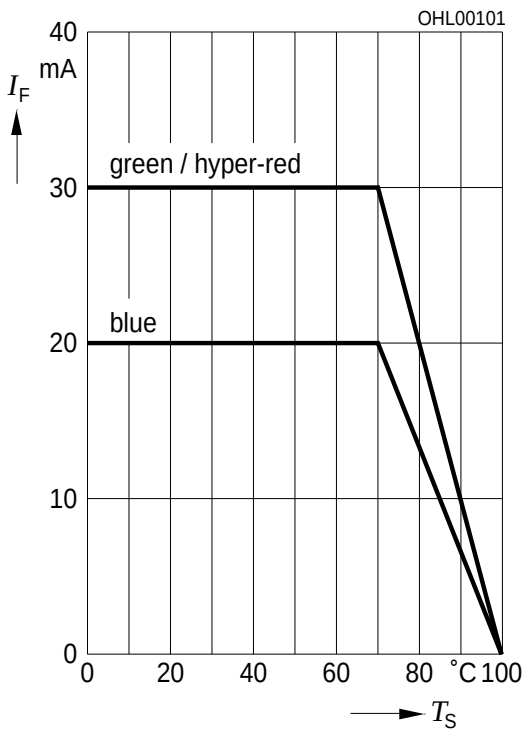
Maximal zulässiger Durchlassstrom $I_F = f(T)$
Max. Permissible Forward Current
1 chip on



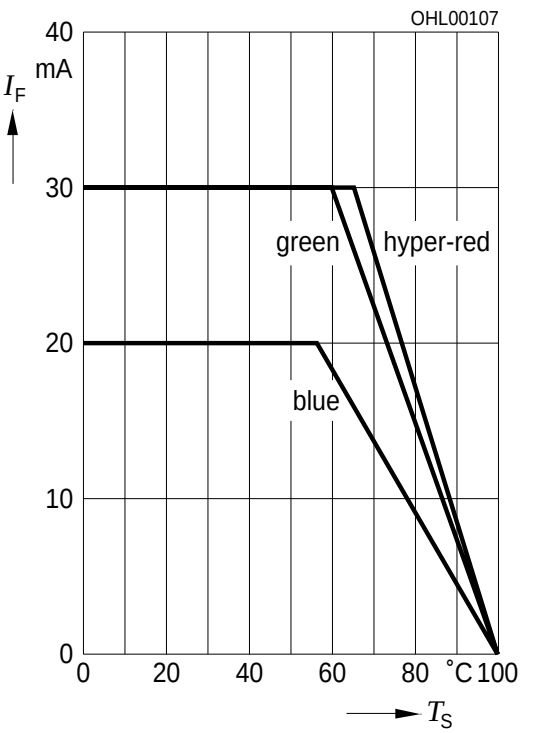
Maximal zulässiger Durchlassstrom $I_F = f(T)$
Max. Permissible Forward Current
3 chips on



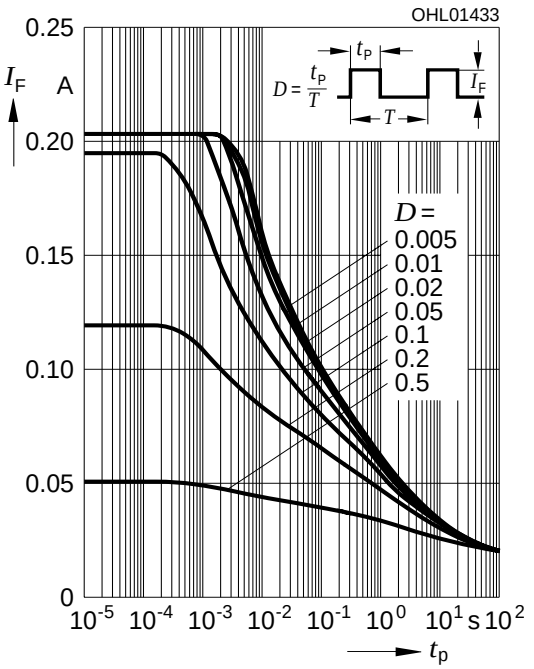
Maximal zulässiger Durchlassstrom $I_F = f(T)$
Max. Permissible Forward Current
1 chip on



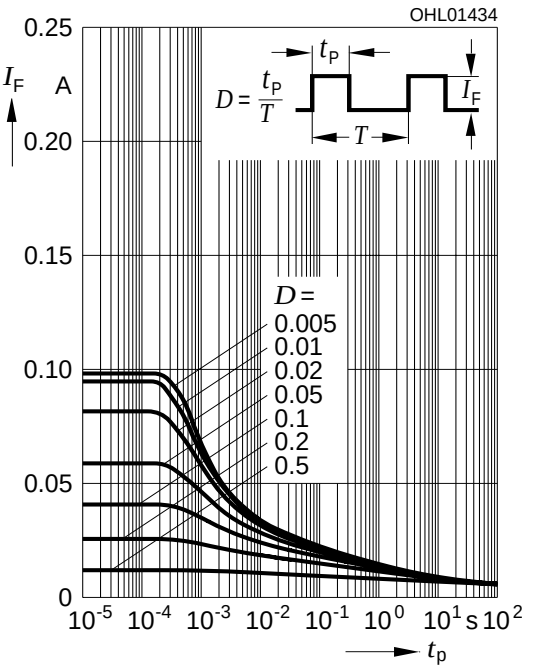
Maximal zulässiger Durchlassstrom $I_F = f(T)$
Max. Permissible Forward Current
3 chips on



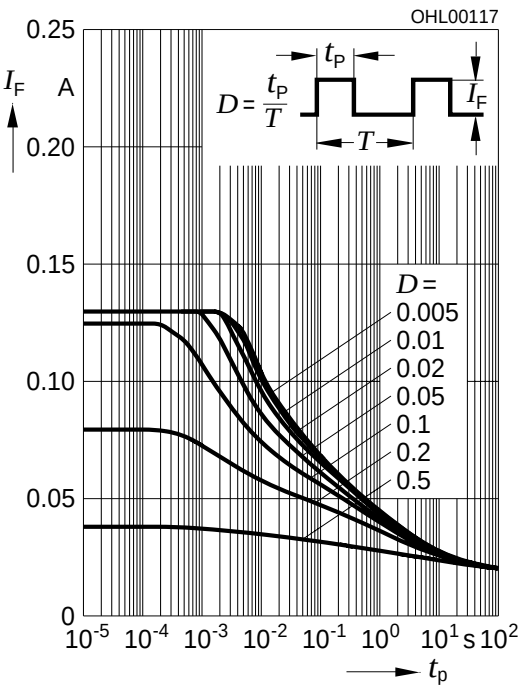
Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability
Duty cycle D = parameter, T_A= 25 °C
blue (1 Chip on)



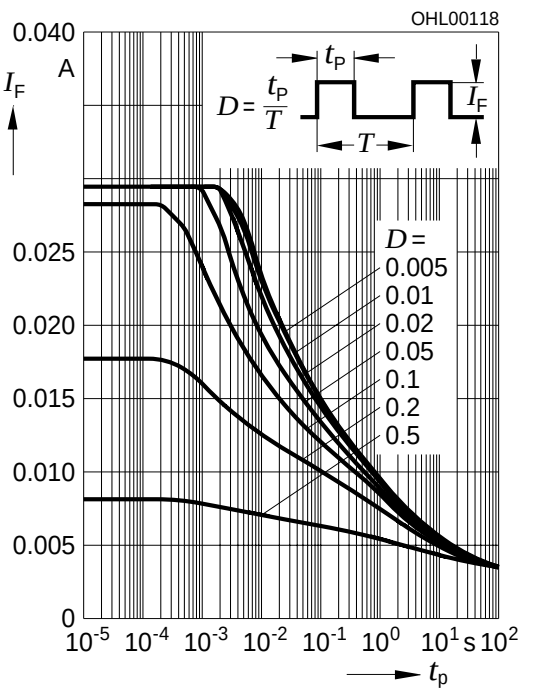
Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability
Duty cycle D = parameter, T_A= 85 °C
blue (1Chip on)



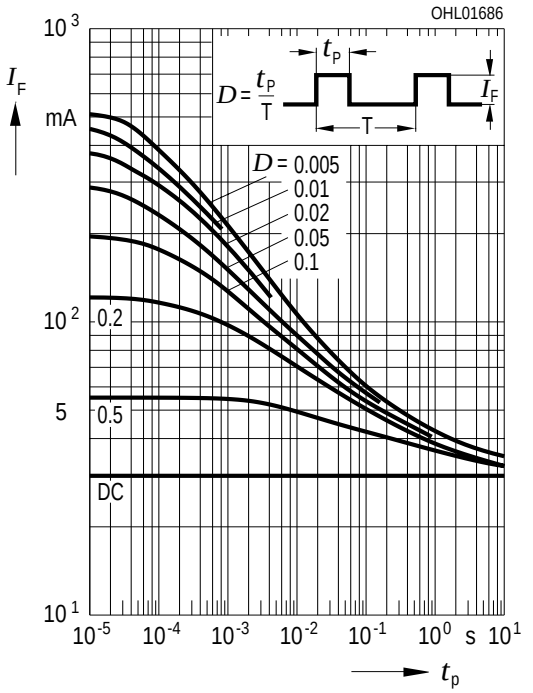
Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability
Duty cycle D = parameter, T_A= 25 °C
blue (3 Chips on)



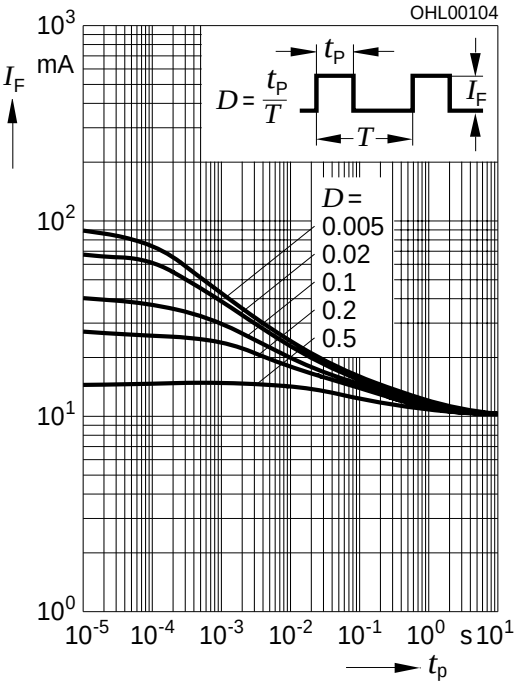
Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability
Duty cycle D = parameter, T_A= 85 °C
blue (3 Chips on)



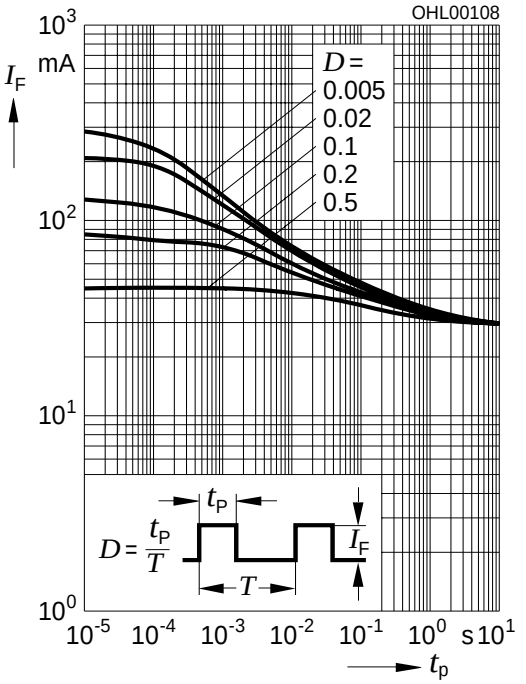
Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability
Duty cycle D = parameter, T_A= 25 °C
green/hyper-red (1 Chip on)



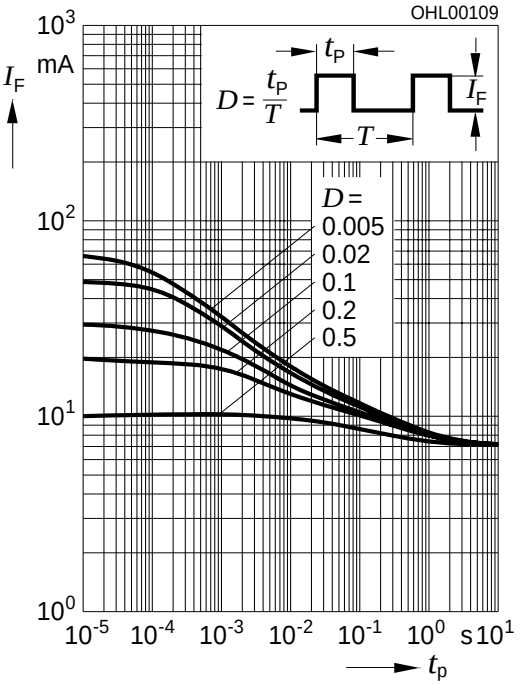
Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability
Duty cycle D = parameter, T_A= 85 °C
green/hyper-red (1 Chip on)



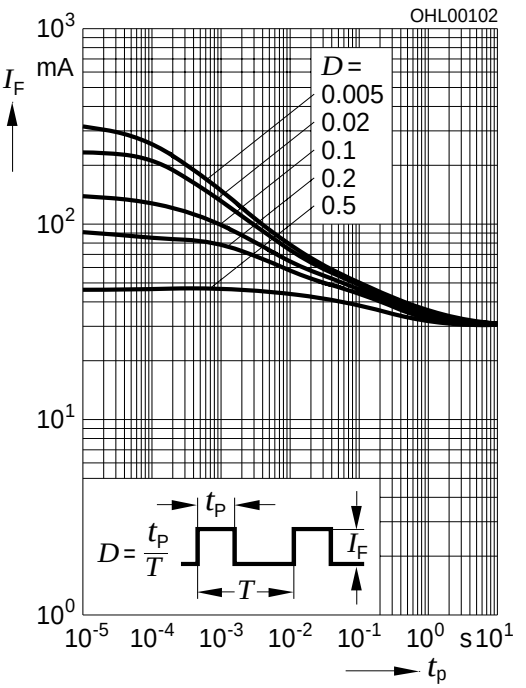
Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability
Duty cycle D = parameter, T_A= 25 °C
green (3 Chips on)



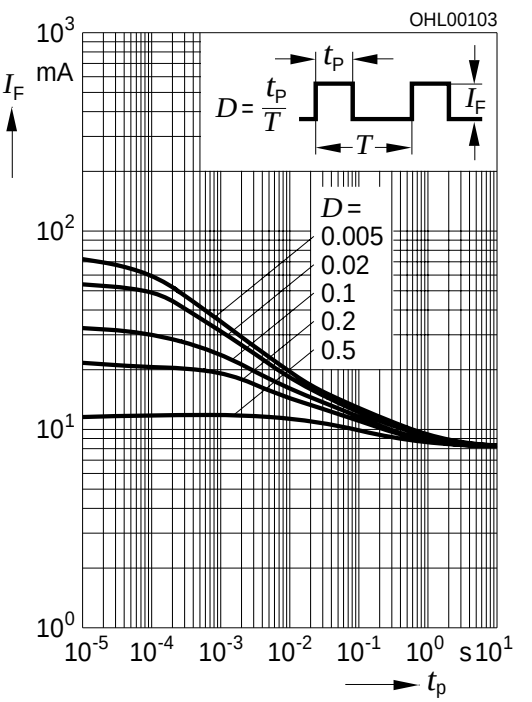
Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability
Duty cycle D = parameter, T_A= 85 °C
green (3 Chips on)

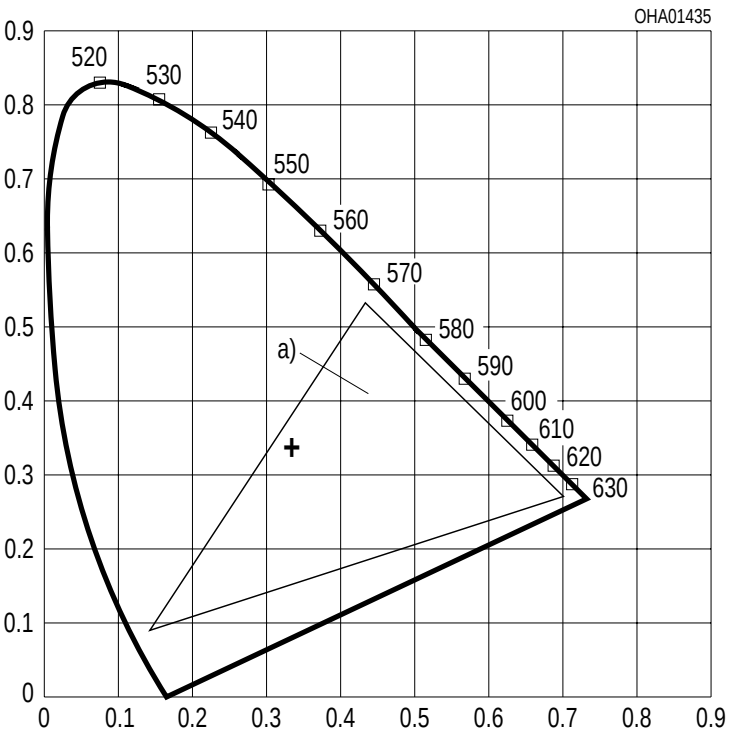


Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability
Duty cycle D = parameter, T_A= 25 °C
hyper-red (3 Chips on)



Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability
Duty cycle D = parameter, T_A= 85 °C
hyper-red (3 Chips on)

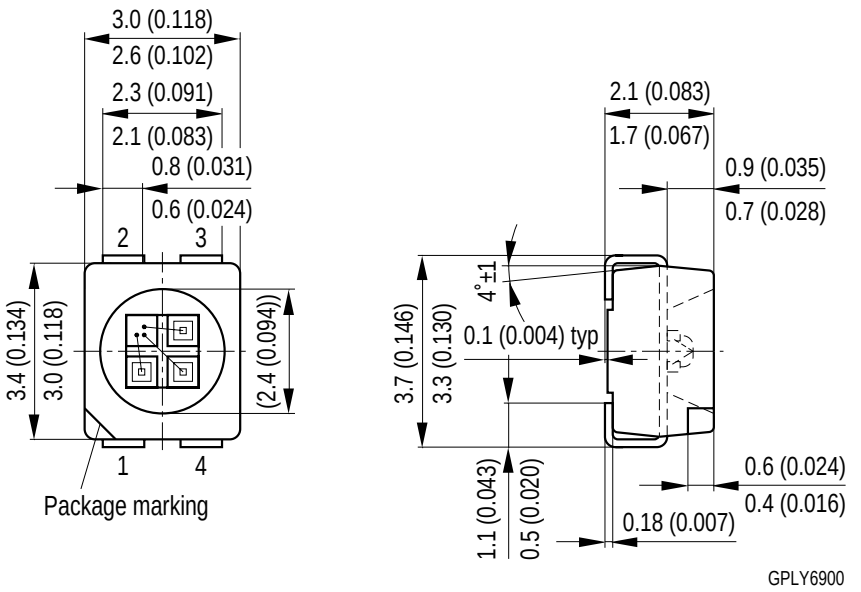




Die Farbkoordinaten des Mischlichtes können innerhalb des mit a) gekennzeichneten Bereichs des Farbdreiecks erwartet werden.
Der Unbuntpunkt (x = 0,33, y = 0,33) ist mit „+“ gekennzeichnet.

The color coordinates of the mixed light can be expected within the area of the color triangle marked a).
The achromatic point (x = 0.33, y = 0.33) is marked “+”.

Maßzeichnung
Package Outlines



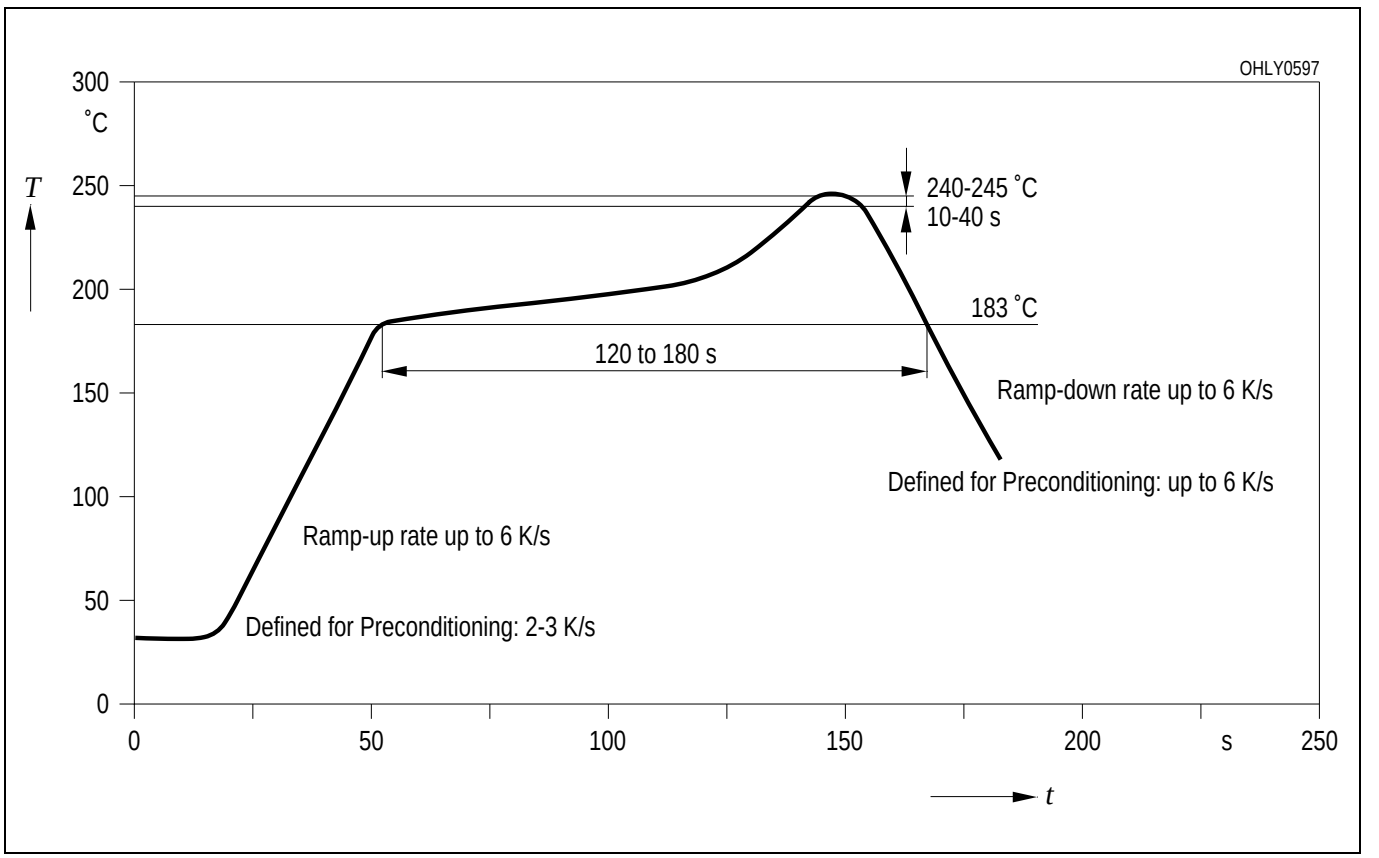
1	Cathode	Hyper-red(H)
2	Anode	H, G, B
3	Cathode	Blue (B)
4	Cathode	Green (G)

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

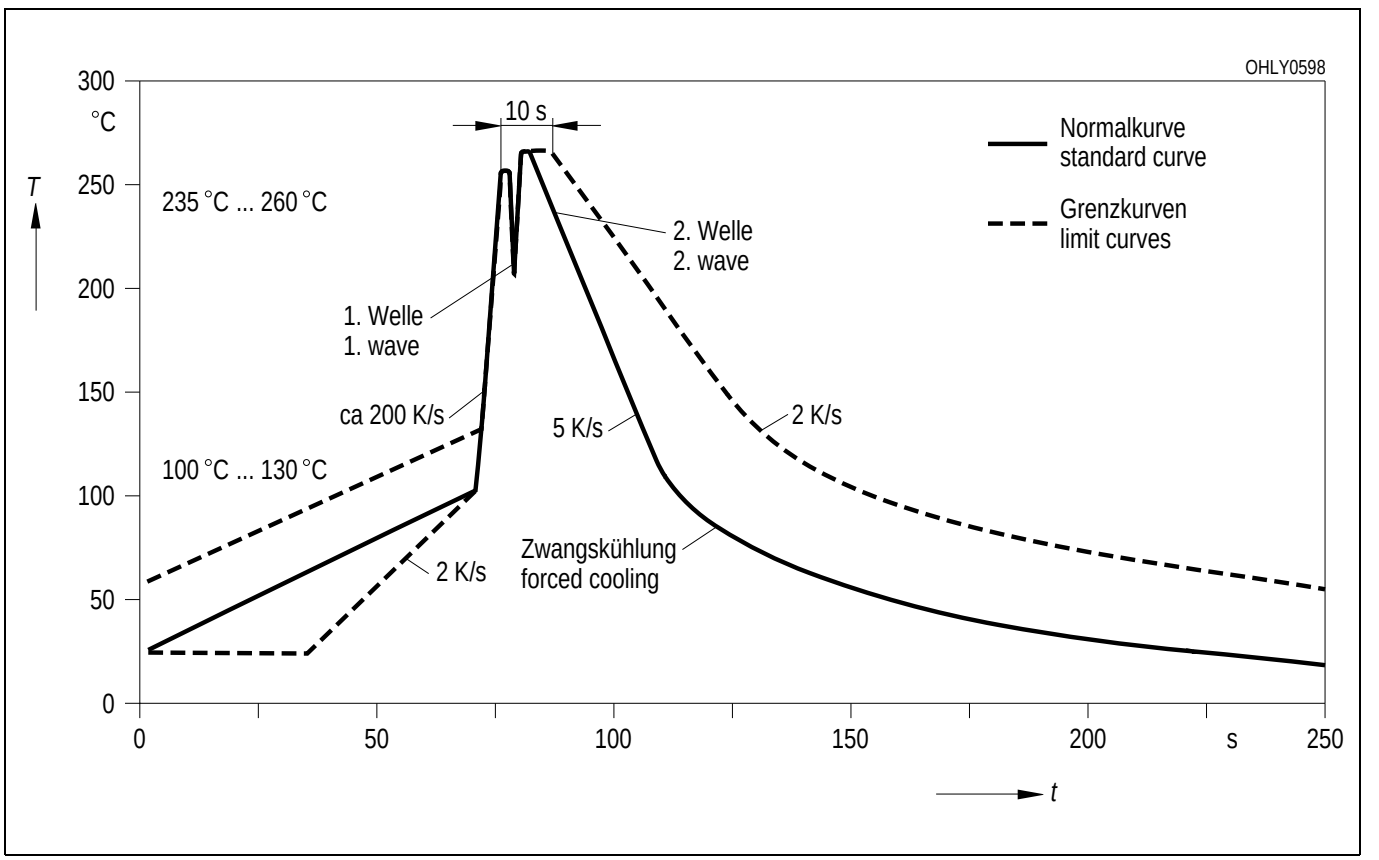
Gewicht / Approx. weight: 34 mg

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

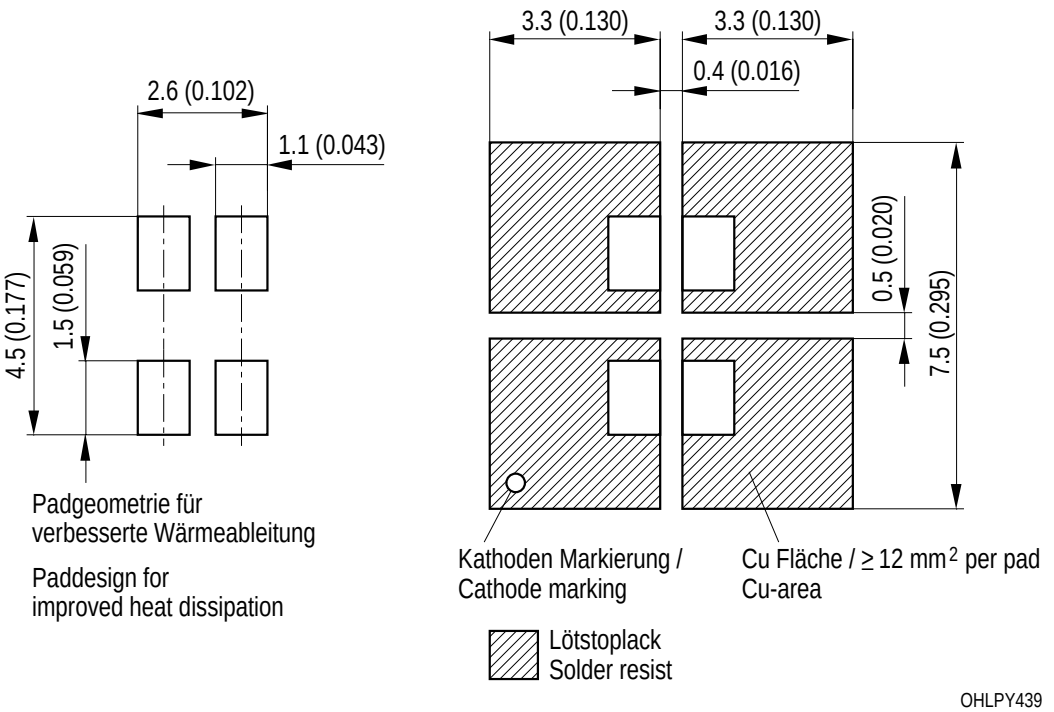
IR-Reflow Lötprofil (nach IPC 9501)
IR Reflow Soldering Profile (acc. to IPC 9501)



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

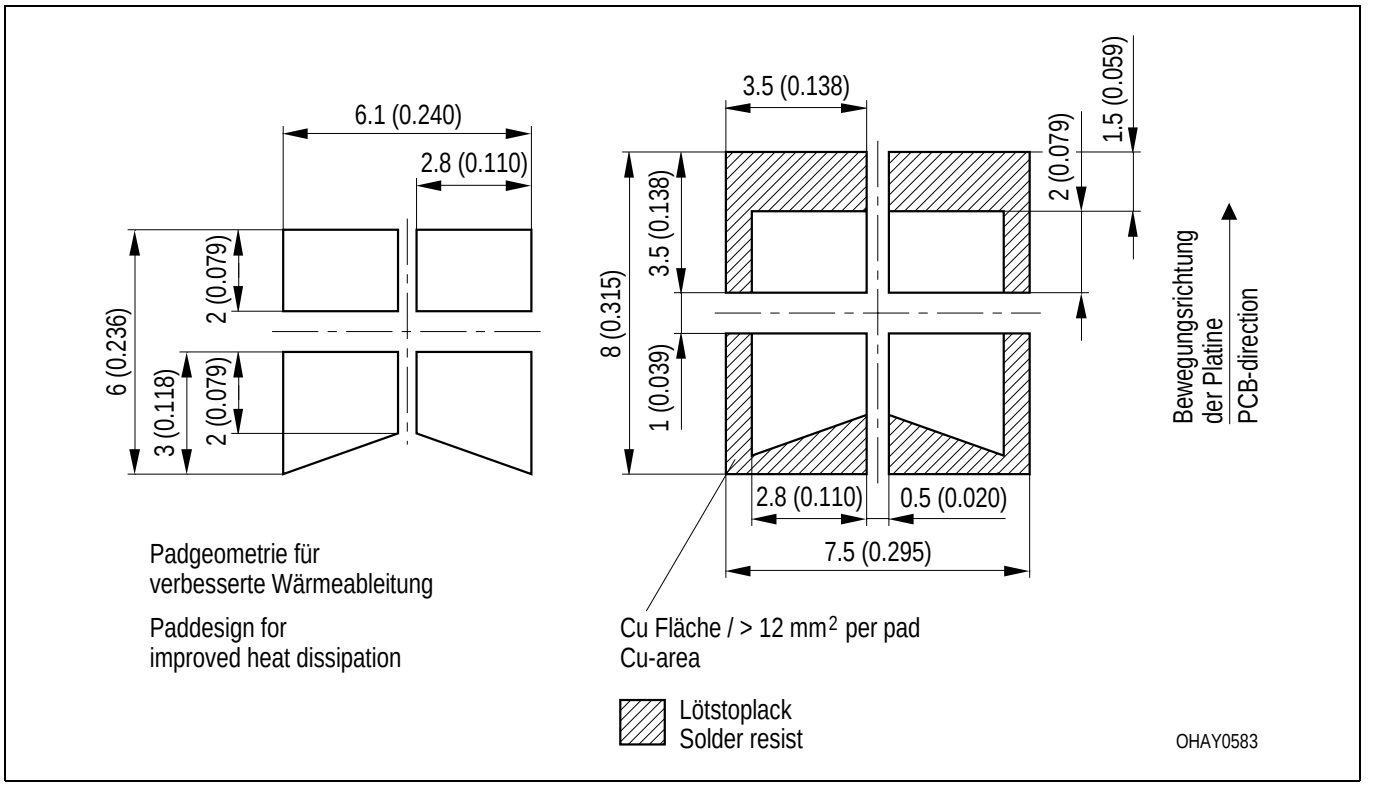


Empfohlenes Lötpaddesign IR Reflow Löten
Recommended Solder Pad IR Reflow Soldering



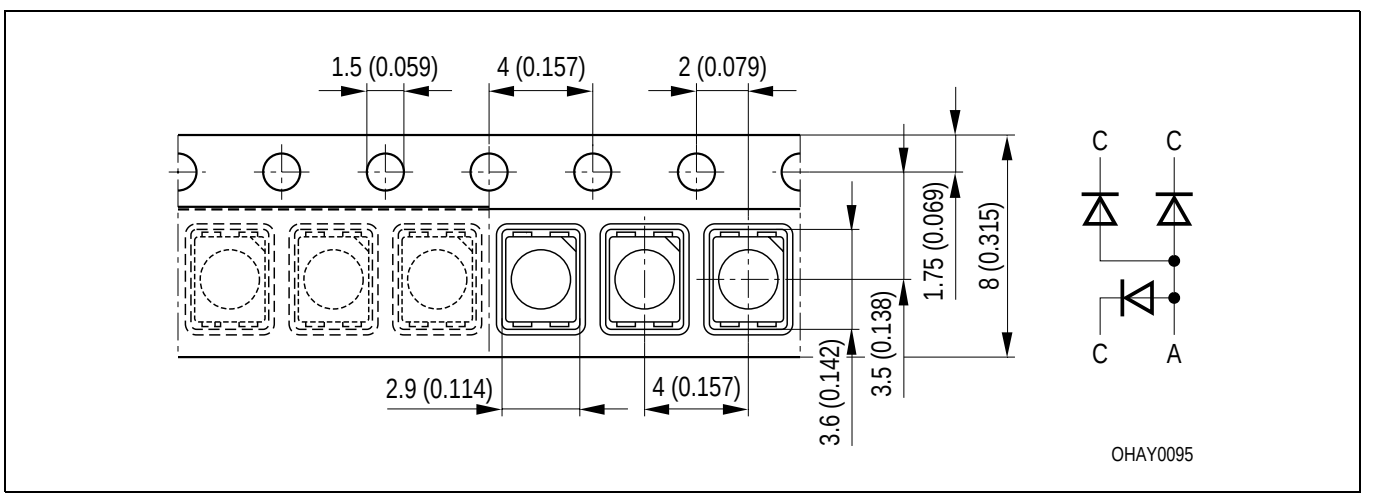
Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

Empfohlenes Lötpaddesign Wellenlöten (TTW)
Recommended Solder Pad TTW Soldering



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

Gurtung / Polarität und Lage Verpackungseinheit 8000/Rolle, ø330 mm
Method of Taping / Polarity and Orientation Packing unit 8000/reel, ø330 mm



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

Revision History: 2002-05-23	
Previous Version: 2001-05-21	
Page	**Subjects (major changes since last revision)**
4	Durchlassspannung / Forward voltage (typ.)
2	Luminous intensity grouping (B)

Published by OSRAM Opto Semiconductors GmbH & Co. OHG
Wernerwerkstrasse 2, D-93049 Regensburg

Attention please!
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.
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.