

# 6-lead MULTILED® Enhanced optical Power LED (HOP2000 / ATON®)

## LATB G66B



### Vorläufige Daten / Preliminary Data

#### Besondere Merkmale

- **Gehäusetyp:** weißes P-LCC-6 Gehäuse, Kontrasterhöhung durch schwarze Oberfläche (RGB-Displays) und diffuses Harz
- **Besonderheit des Bauteils:** additive Farbmischung durch unabhängige Ansteuerung aller Chips
- **Wellenlänge:** 617 nm (amber), 528 nm (true green), 470 nm (blau)
- **Abstrahlwinkel:** Lambertscher Strahler (120°)
- **Technologie:** InGaAlP (amber), InGaN (true green, blau)
- **optischer Wirkungsgrad:** 24 lm/W (amber), 13 lm/W (true green), 3 lm/W (blau)
- **Gruppierungsparameter:** Lichtstärke, Wellenlänge
- **Verarbeitungsmethode:** für alle SMT-Bestücktechniken geeignet
- **Lötmethode:** IR Reflow Löten
- **Vorbehandlung:** nach JEDEC Level 2
- **Gurtung:** 12 mm Gurt mit 1000/Rolle, ø180 mm oder 4000/Rolle, ø330 mm
- **ESD-Festigkeit:** ESD-sicher bis 2 kV nach JESD22-A114-B

#### Anwendungen

- Anzeigen im Innen- und Außenbereich (z.B. im Verkehrsbereich; Laufschriftanzeigen)
- Getrennte Anteuierung der Leuchtdiodenchips zur Darstellung verschiedener Farben inklusive weiß
- Vollfarbdisplays bzw. RGB-Displays
- Hinterleuchtung (LCD, Schalter, Tasten, Werbebeleuchtung, Allgemeinbeleuchtung)
- Einkopplung in Lichtleiter

#### Features

- **package:** white P-LCC-6 package, higher contrast by a black surface (RGB-Displays) and diffused resin
- **feature of the device:** additive mixture of color stimuli by independent driving of each chip
- **wavelength:** 617 nm (amber), 528 nm (true green), 470 nm (blue)
- **viewing angle:** Lambertian Emitter (120°)
- **technology:** InGaAlP (amber), InGaN (true green, blue)
- **optical efficiency:** 24 lm/W (amber), 13 lm/W (true green), 3 lm/W (blue)
- **grouping parameter:** luminous intensity, wavelength
- **assembly methods:** suitable for all SMT assembly methods
- **soldering methods:** IR reflow soldering
- **preconditioning:** acc. to JEDEC Level 2
- **taping:** 12 mm tape with 1000/reel, ø180 mm or 4000/reel, ø330 mm
- **ESD-withstand voltage:** up to 2 kV acc. to JESD22-A114-B

#### Applications

- indoor and outdoor displays (e.g. displays for traffic; light writing displays)
- LED chips can be controlled separately to display various colors including white
- full color displays, RGB-Displays
- backlighting (LCD, switches, keys, illuminated advertising, general lighting)
- coupling into light guides

Typ	Emissions- farbe	Lichtstärke		
Type	Color of Emission	Luminous Intensity $I_F = 20 \text{ mA}$ $I_V \text{ (mcd)}$		
		amber	true green	blue
LATB G66B	amber true green blue	180 ... 450	450 ...1120	71 ...180

**Bestell - Information**  
**Ordering Information**

Typ	Bestellnummer
Type	Ordering Code
LATB G66B-ST-1+TU-35+QR-78	Q65110A0728
LATB G66B-ST-1+UV-35+QR-78	Q65110A1539

Anm.: -78 gesamter Farbbereich, Lieferung in Einzelgruppen (siehe **Seite 5**)

*Die Standardlieferform von Serientypen beinhaltet eine Familiengruppe. Einzelne Helligkeitsgruppen sind nicht bestellbar.  
In einer Verpackungseinheit / Gurt ist immer nur eine Helligkeitsgruppe pro Farbe enthalten.  
Dimmverhältnis im Gleichstrom-Betrieb max. 5:1 für amber*

Note: -78 Total color tolerance range, delivery in single groups (please see **page 5**)

*The standard shipping format for serial types includes a family group. Individual luminous intensity groups cannot be ordered.  
No packing unit / tape ever contains more than one luminous intensity group per color.  
Dimming range for direct current mode max. 5:1 for amber*

**Grenzwerte**  
**Maximum Ratings**

Bezeichnung Parameter	Symbol Symbol	Werte Values			Einheit Unit
		LA	LT	LB	
Betriebstemperatur Operating temperature range	$T_{op}$	- 40 ... + 100			°C
Lagertemperatur Storage temperature range	$T_{stg}$	- 40 ... + 100			°C
Sperrschichttemperatur Junction temperature	$T_j$	+ 125	+ 125	+ 110	°C
Durchlassstrom Forward current ( $T_A=25^\circ\text{C}$ )	$I_F$	70	30	30	mA
Stoßstrom Surge current $t_p = 10 \mu\text{s}$ , $D = 0.005$ , $T_A=25^\circ\text{C}$	$I_{FM}$	100	250	200	mA
Sperrspannung <sup>1)</sup> Reverse voltage ( $T_A=25^\circ\text{C}$ )	$V_R$	12	5	5	V
Leistungsaufnahme Power consumption ( $T_A=25^\circ\text{C}$ )	$P_{tot}$	180	140	140	mW
Wärmewiderstand Thermal resistance					
Sperrschicht/Umgebung <sup>2)</sup> Junction/ambient <sup>2)</sup>	1 chip on $R_{th JA}$	350	400	400	K/W
	3 chips on $R_{th JA}$	560	640	640	K/W
Sperrschicht/Lötpad Junction/solder point	1 chip on $R_{th JS}$	200	230	230	K/W
	3 chips on $R_{th JS}$	200	230	230	K/W

<sup>1)</sup> für kurzzeitigen Betrieb geeignet / suitable for short term application

<sup>2)</sup> Montage auf PC-Board FR 4 (Padgröße  $\geq 16 \text{ mm}^2$ )  
mounted on PC board FR 4 (pad size  $\geq 16 \text{ mm}^2$ )

Kennwerte ( $T_A = 25\text{ °C}$ )

## Characteristics

Bezeichnung Parameter	Symbol Symbol	Werte Values			Einheit Unit
		LA	LT	LB	
Wellenlänge des emittierten Lichtes (typ.) Wavelength at peak emission $I_F = 20\text{ mA}$	$\lambda_{\text{peak}}$	624	523	465	nm
Dominantwellenlänge <sup>1)</sup> Dominant wavelength $I_F = 20\text{ mA}$	$\lambda_{\text{dom}}$	617 -2/+7	528 $\pm 9$	470 $\pm 6$	nm
Spektrale Bandbreite bei 50 % $I_{\text{rel max}}$ (typ.) Spectral bandwidth at 50 % $I_{\text{rel max}}$ $I_F = 20\text{ mA}$	$\Delta\lambda$	18	33	25	nm
Abstrahlwinkel bei 50 % $I_V$ (Vollwinkel) (typ.) Viewing angle at 50 % $I_V$	$2\phi$	120	120	120	Grad deg.
Durchlassspannung <sup>2)</sup> (min.) Forward voltage (typ.) $I_F = 20\text{ mA}$ (max.)	$V_F$ $V_F$ $V_F$	2.0 2.4	3.5 4.1	3.6 4.1	V V V
Sperrstrom (typ.) Reverse current (max.) $V_R = 5\text{ V}$ (blue / true green); 12 V (amber)	$I_R$ $I_R$	0.01 10	0.01 10	0.01 10	$\mu\text{A}$ $\mu\text{A}$
Temperaturkoeffizient von $\lambda_{\text{peak}}$ (typ.) Temperature coefficient of $\lambda_{\text{peak}}$ $I_F = 20\text{ mA}$ ; $-10\text{ °C} \leq T \leq 100\text{ °C}$	$TC_{\lambda_{\text{peak}}}$	0.15	0.04	0.05	nm/K
Temperaturkoeffizient von $\lambda_{\text{dom}}$ (typ.) Temperature coefficient of $\lambda_{\text{dom}}$ $I_F = 20\text{ mA}$ ; $-10\text{ °C} \leq T \leq 100\text{ °C}$	$TC_{\lambda_{\text{dom}}}$	0.07	0.03	0.04	nm/K
Temperaturkoeffizient von $V_F$ (typ.) Temperature coefficient of $V_F$ $I_F = 20\text{ mA}$ ; $-10\text{ °C} \leq T \leq 100\text{ °C}$	$TC_V$	- 3.7	- 3.6	- 3.1	mV/K
Optischer Wirkungsgrad (typ.) Optical efficiency $I_F = 20\text{ mA}$	$\eta_{\text{opt}}$	24	13	3	lm/W

<sup>1)</sup> Wellenlängen werden mit einer Stromeinprägungsdauer von 25 ms und einer Genauigkeit von  $\pm 1\text{ nm}$  ermittelt.  
Wavelengths are tested at a current pulse duration of 25 ms and a tolerance of  $\pm 1\text{ nm}$ .

<sup>2)</sup> Durchlassspannungen werden mit einer Stromeinprägungsdauer von 1 ms und einer Genauigkeit von  $\pm 0,1\text{ V}$  ermittelt.  
Forward voltages are tested at a current pulse duration of 1 ms and a tolerance of  $\pm 0.1\text{ V}$ .

1) Wellenlängengruppen für Dominantwellenlänge  
Wavelength groups for dominant wavelength

Gruppe Group	true green		Einheit Unit
	min.	max.	
3	518.5	526.5	nm
4	523.5	531.5	nm
5	528.5	536.5	nm

Gruppe Group	blue		Einheit Unit
	min.	max.	
7	463.5	471.5	nm
8	468.5	476.5	nm

Lichtgruppe Luminous Intensity Group	Lichtstärke Luminous Intensity	Lichtstrom Luminous Flux	Lichtstärke Luminous Intensity	Lichtstrom Luminous Flux	Lichtstärke Luminous Intensity	Lichtstrom Luminous Flux
	$I_V$ (mcd)	$\Phi_V$ (mlm)	$I_V$ (mcd)	$\Phi_V$ (mlm)	$I_V$ (mcd)	$\Phi_V$ (mlm)
	amber		true green		blue	
S+T+Q	180 ... 280	680 (typ.)	280 ... 450	1075 (typ.)	71 ... 112	270 (typ.)
S+T+R	180 ... 280	680 (typ.)	280 ... 450	1075 (typ.)	112 ... 180	430 (typ.)
S+U+Q	180 ... 280	680 (typ.)	450 ... 710	1700 (typ.)	71 ... 112	270 (typ.)
S+U+R	180 ... 280	680 (typ.)	450 ... 710	1700 (typ.)	112 ... 180	430 (typ.)
S+V+Q	180 ... 280	680 (typ.)	710 ... 1120	2700 (typ.)	71 ... 112	270 (typ.)
S+V+R	180 ... 280	680 (typ.)	710 ... 1120	2700 (typ.)	112 ... 180	430 (typ.)
T+T+Q	280 ... 450	1075 (typ.)	280 ... 450	1075 (typ.)	71 ... 112	270 (typ.)
T+T+R	280 ... 450	1075 (typ.)	280 ... 450	1075 (typ.)	112 ... 180	430 (typ.)
T+U+Q	280 ... 450	1075 (typ.)	450 ... 710	1700 (typ.)	71 ... 112	270 (typ.)
T+U+R	280 ... 450	1075 (typ.)	450 ... 710	1700 (typ.)	112 ... 180	430 (typ.)
T+V+Q	280 ... 450	1075 (typ.)	710 ... 1120	2700 (typ.)	71 ... 112	270 (typ.)
T+V+R	280 ... 450	1075 (typ.)	710 ... 1120	2700 (typ.)	112 ... 180	430 (typ.)

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

**Gruppenbezeichnung auf Etikett**

**Group Name on Label**

Beispiel: T-1+U-4+R-7

Example: T-1+U-4+R-7

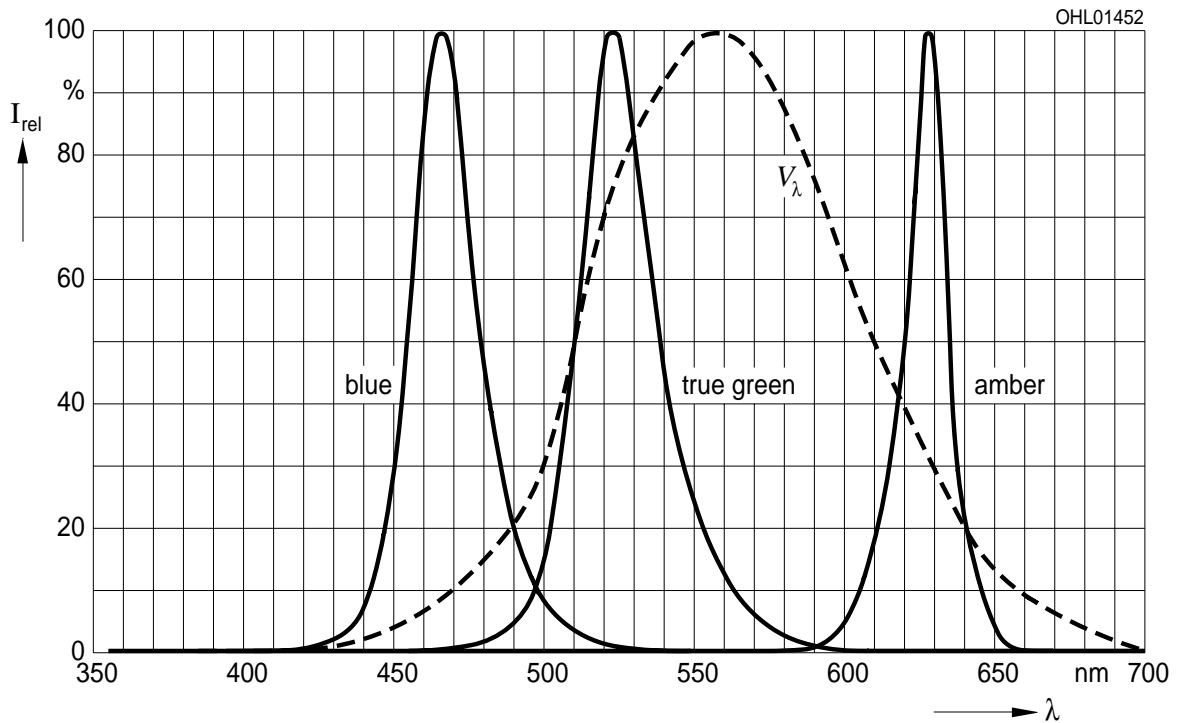
<b>Lichtgruppe</b>	<b>Wellenlänge (keine Gruppierung)</b>	<b>Lichtgruppe</b>	<b>Wellenlänge</b>	<b>Lichtgruppe</b>	<b>Wellenlänge</b>
<b>Luminous Intensity Group (amber)</b>	<b>Wavelength (no grouping) (amber)</b>	<b>Luminous Intensity Group (true green)</b>	<b>Wavelength (true green)</b>	<b>Luminous Intensity Group (blue)</b>	<b>Wavelength (blue)</b>
T	1	U	4	R	7

Relative spektrale Emission  $I_{rel} = f(\lambda)$ ,  $T_A = 25\text{ °C}$ ,  $I_F = 20\text{ mA}$

Relative Spectral Emission

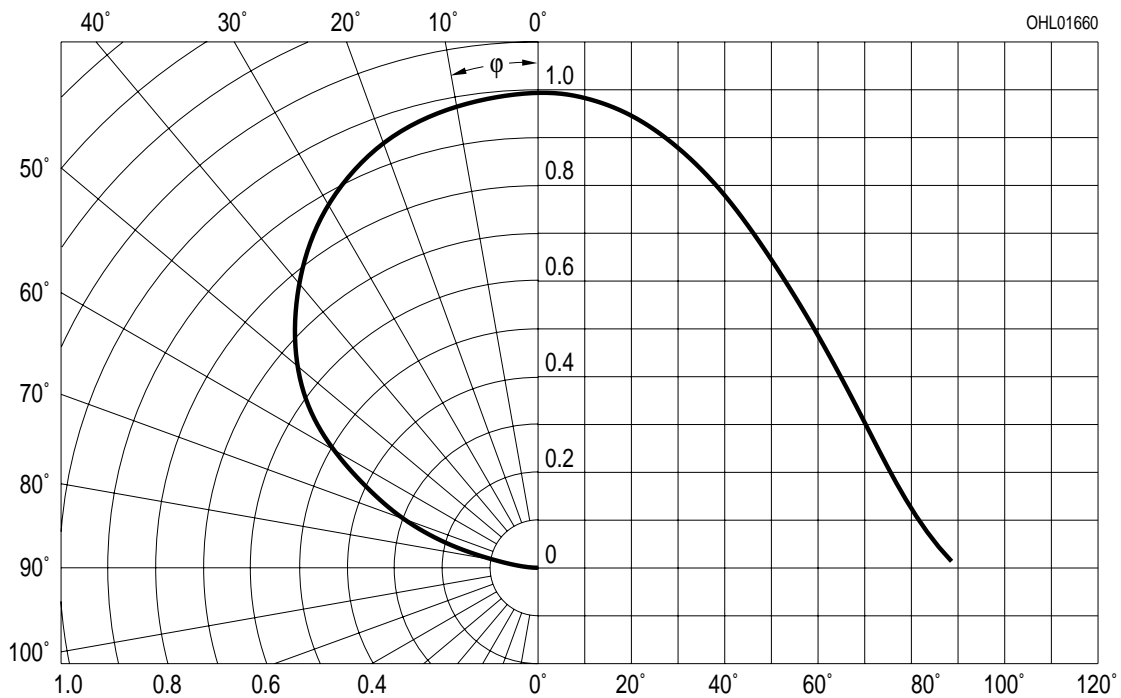
$V(\lambda)$  = spektrale Augenempfindlichkeit

Standard eye response curve

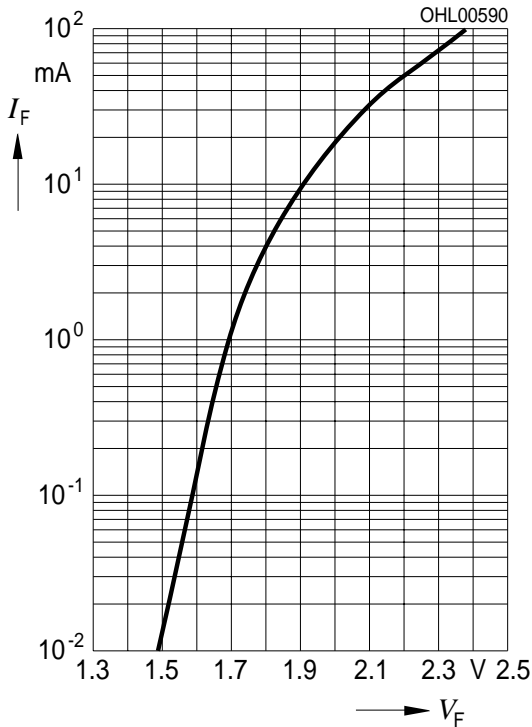


Abstrahlcharakteristik  $I_{rel} = f(\varphi)$

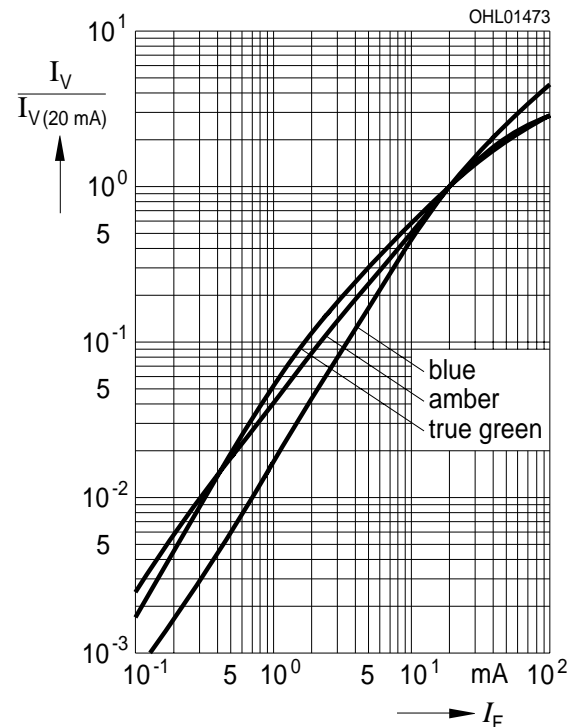
Radiation Characteristic



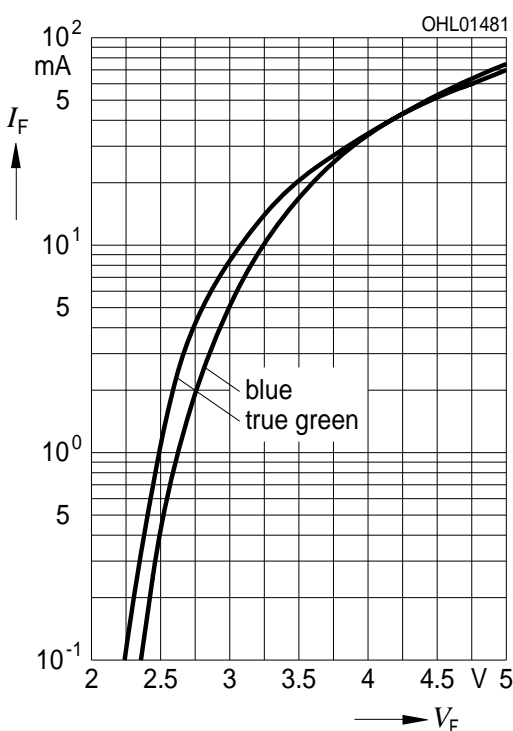
**Durchlassstrom  $I_F = f(V_F)$**   
**Forward Current**  
 $T_A = 25\text{ °C}$ ; amber



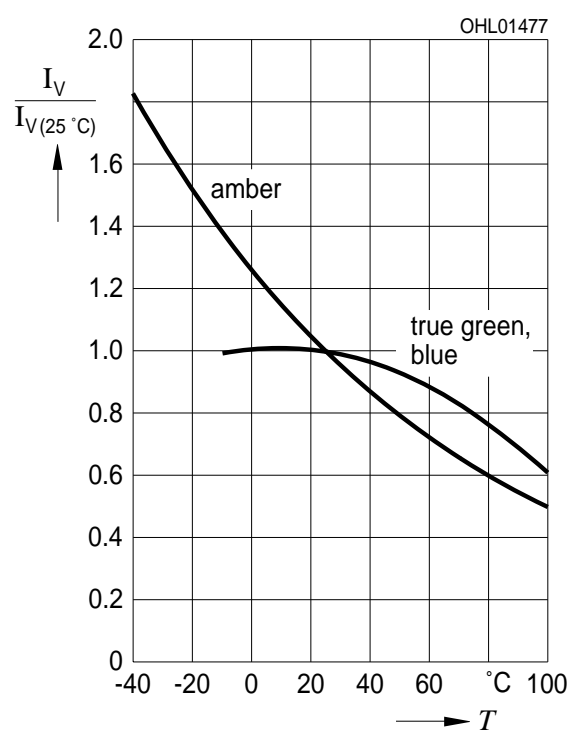
**Relative Lichtstärke  $I_V/I_{V(20\text{ mA})} = f(I_F)$**   
**Relative Luminous Intensity**  
 $T_A = 25\text{ °C}$



**Durchlassstrom  $I_F = f(V_F)$**   
**Forward Current**  
 $T_A = 25\text{ °C}$

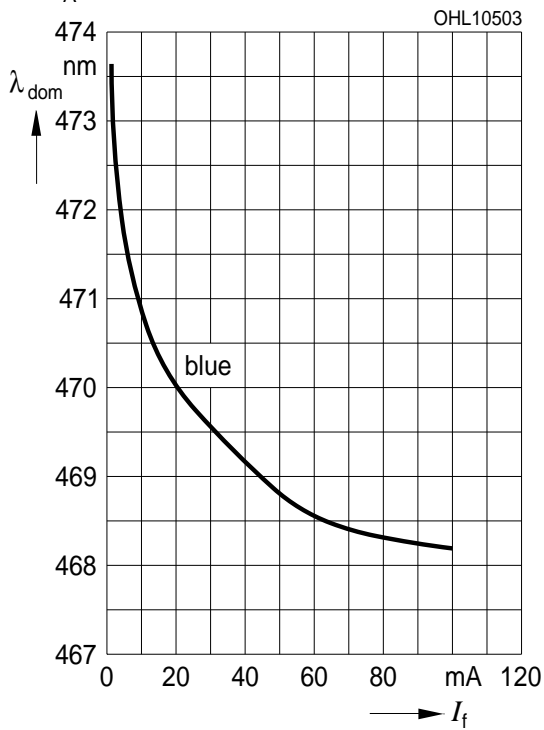


**Relative Lichtstärke  $I_V/I_{V(25\text{ °C})} = f(T_A)$**   
**Relative Luminous Intensity**  
 $I_F = 20\text{ mA}$

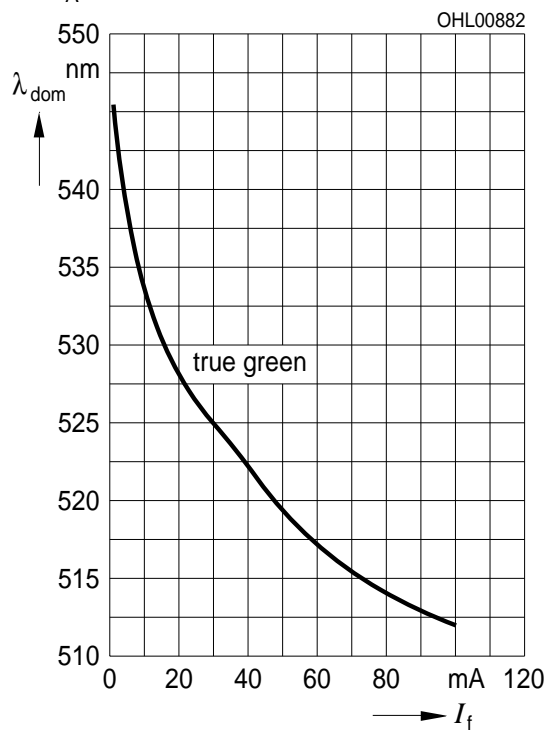




**Dominante Wellenlänge  $\lambda_{\text{dom}} = f(I_F)$**   
**Dominant Wavelength**  
**LB,  $T_A = 25\text{ °C}$**



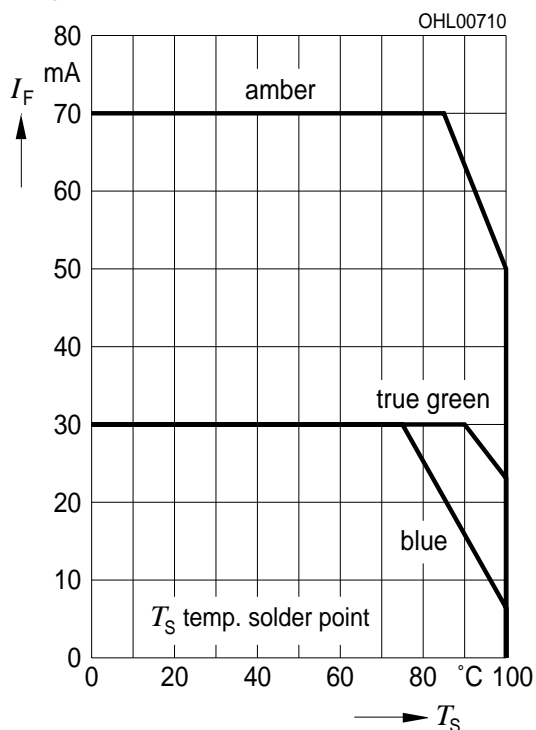
**Dominante Wellenlänge  $\lambda_{\text{dom}} = f(I_F)$**   
**Dominant Wavelength**  
**LT,  $T_A = 25\text{ °C}$**



**Maximal zulässiger Durchlassstrom  $I_F = f(T)$**

**Max. Permissible Forward Current**

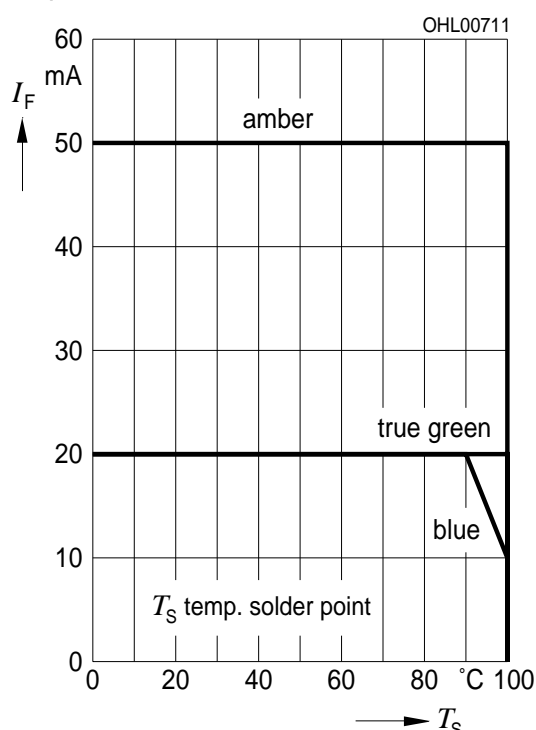
1 chip on



**Maximal zulässiger Durchlassstrom  $I_F = f(T)$**

**Max. Permissible Forward Current**

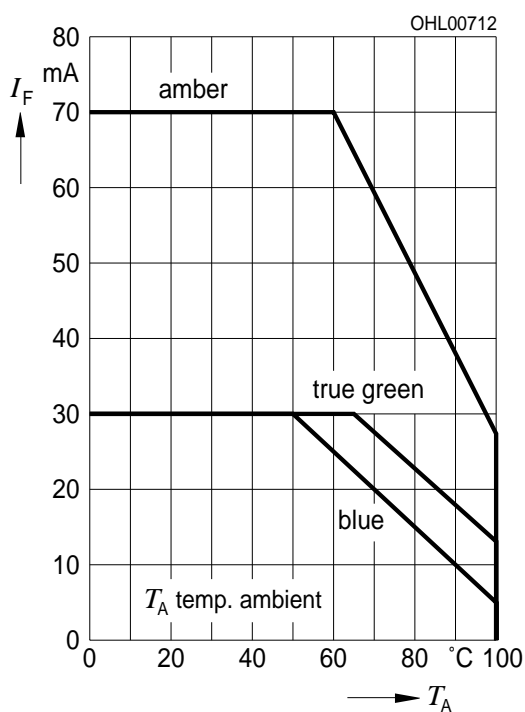
3 chips on



**Maximal zulässiger Durchlassstrom  $I_F = f(T)$**

**Max. Permissible Forward Current**

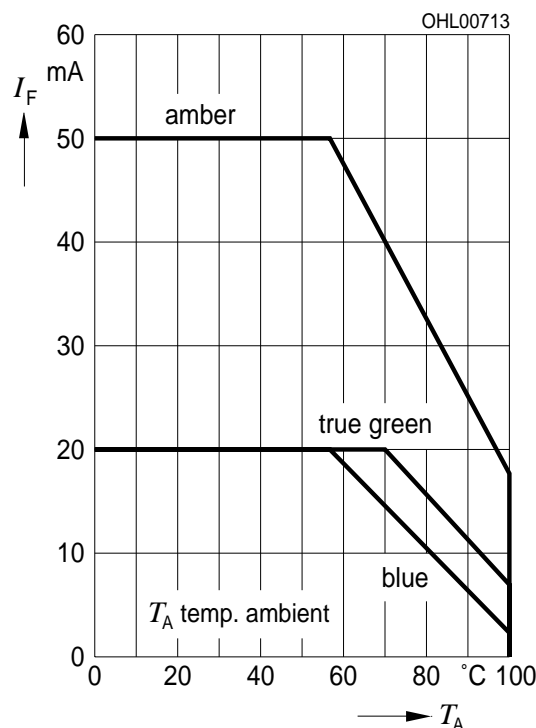
1 chip on



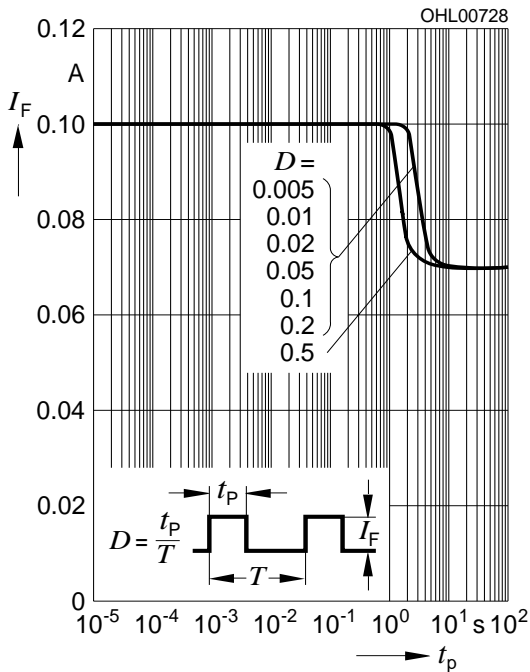
**Maximal zulässiger Durchlassstrom  $I_F = f(T)$**

**Max. Permissible Forward Current**

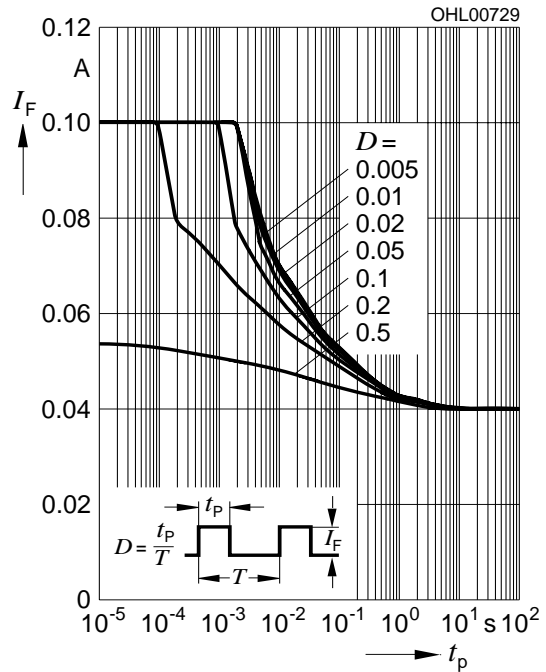
3 chips on



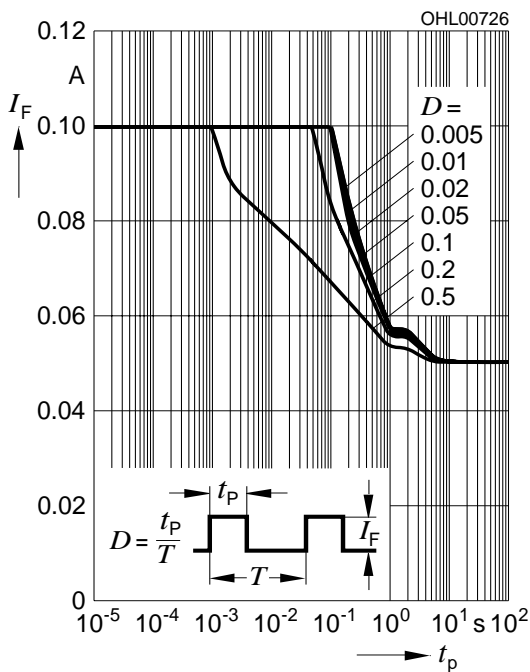
**Zulässige Impulsbelastbarkeit  $I_F = f(t_p)$**   
**Permissible Pulse Handling Capability**  
 Duty cycle  $D =$  parameter,  $T_A = 25\text{ °C}$   
**amber (1 Chip on)**



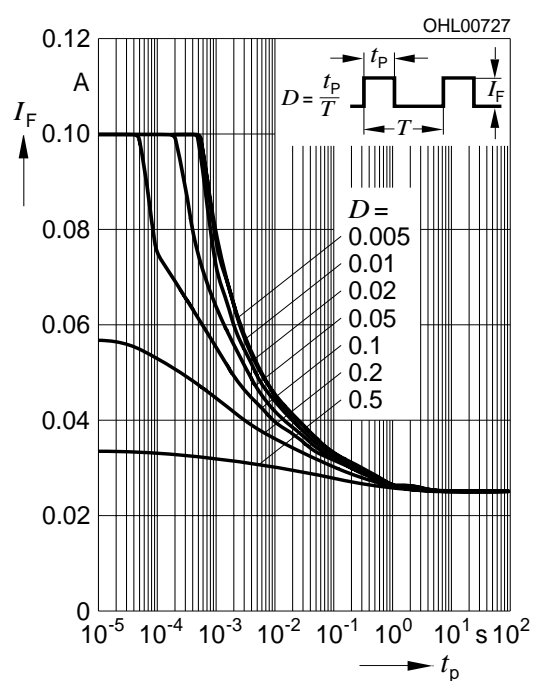
**Zulässige Impulsbelastbarkeit  $I_F = f(t_p)$**   
**Permissible Pulse Handling Capability**  
 Duty cycle  $D =$  parameter,  $T_A = 85\text{ °C}$   
**amber (1Chip on)**



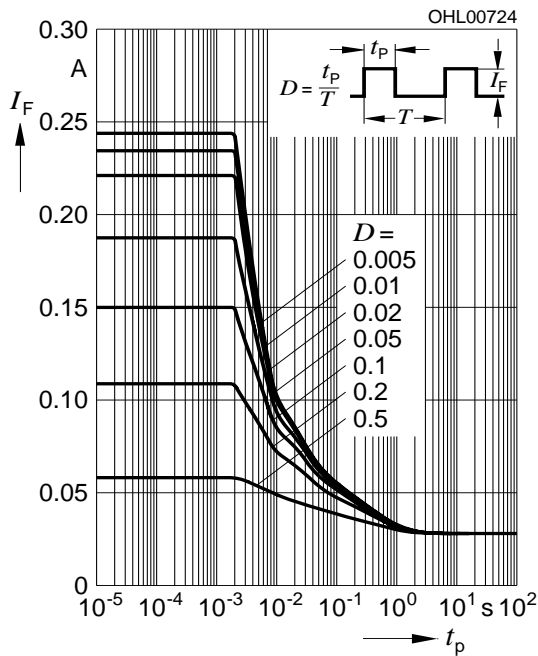
**Zulässige Impulsbelastbarkeit  $I_F = f(t_p)$**   
**Permissible Pulse Handling Capability**  
 Duty cycle  $D =$  parameter,  $T_A = 25\text{ °C}$   
**amber (3 Chips on)**



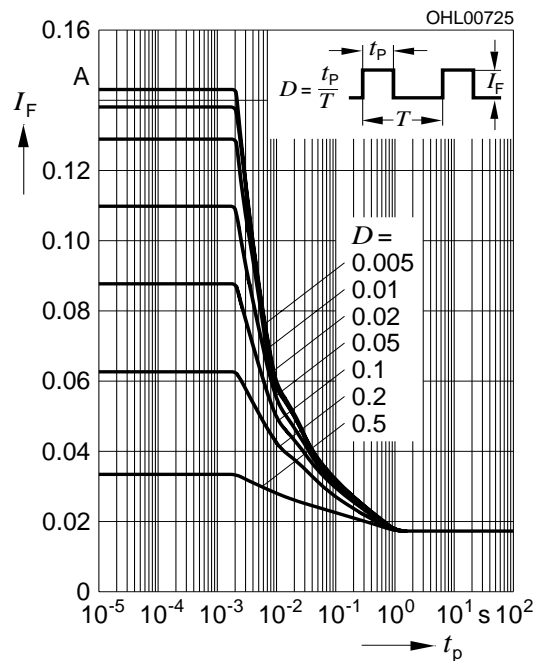
**Zulässige Impulsbelastbarkeit  $I_F = f(t_p)$**   
**Permissible Pulse Handling Capability**  
 Duty cycle  $D =$  parameter,  $T_A = 85\text{ °C}$   
**amber (3 Chips on)**



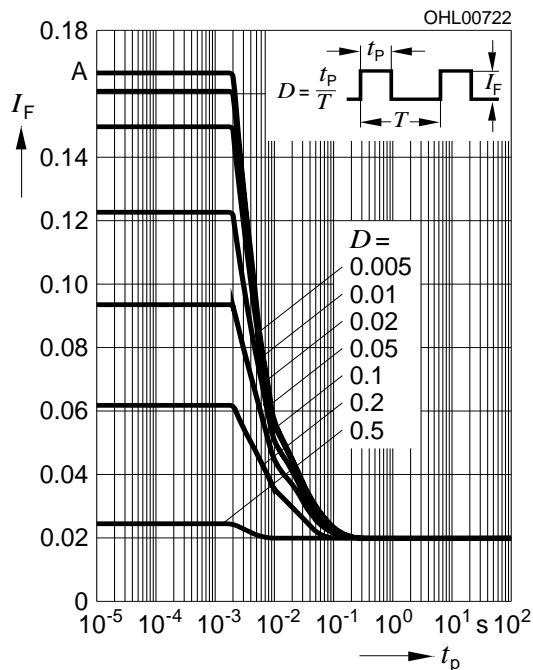
**Zulässige Impulsbelastbarkeit  $I_F = f(t_p)$**   
**Permissible Pulse Handling Capability**  
 Duty cycle  $D =$  parameter,  $T_A = 25\text{ °C}$   
 true green (1 Chip on)



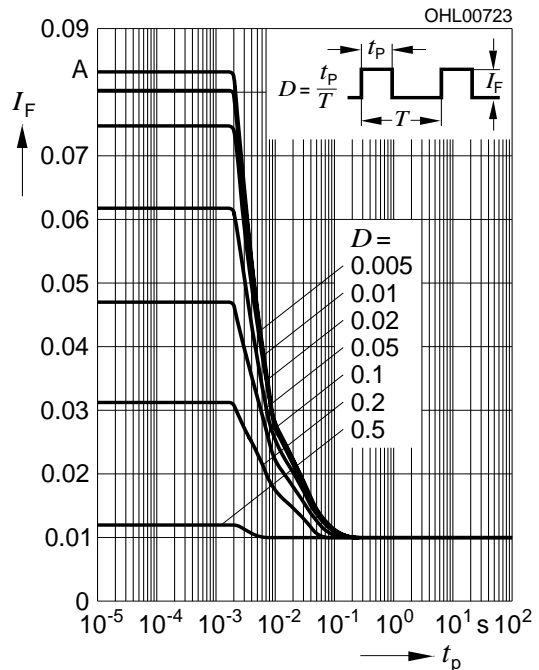
**Zulässige Impulsbelastbarkeit  $I_F = f(t_p)$**   
**Permissible Pulse Handling Capability**  
 Duty cycle  $D =$  parameter,  $T_A = 85\text{ °C}$   
 true green (1 Chip on)



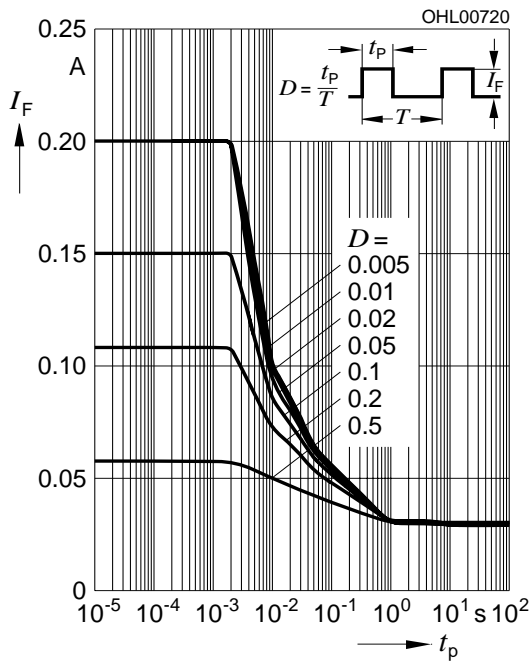
**Zulässige Impulsbelastbarkeit  $I_F = f(t_p)$**   
**Permissible Pulse Handling Capability**  
 Duty cycle  $D =$  parameter,  $T_A = 25\text{ °C}$   
 true green (3 Chips on)



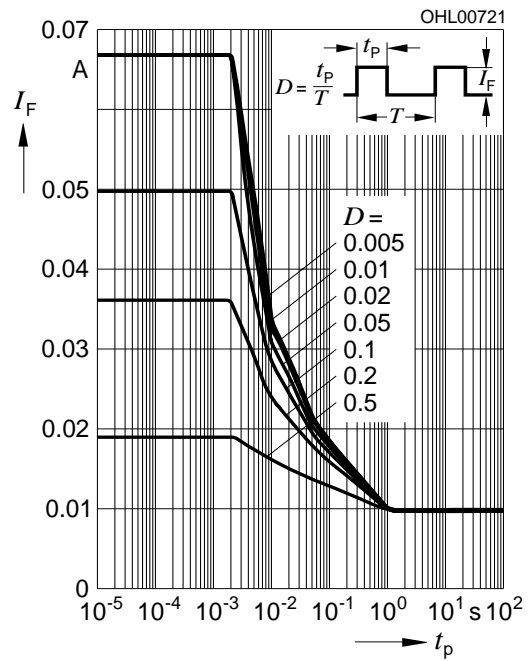
**Zulässige Impulsbelastbarkeit  $I_F = f(t_p)$**   
**Permissible Pulse Handling Capability**  
 Duty cycle  $D =$  parameter,  $T_A = 85\text{ °C}$   
 true green (3 Chips on)



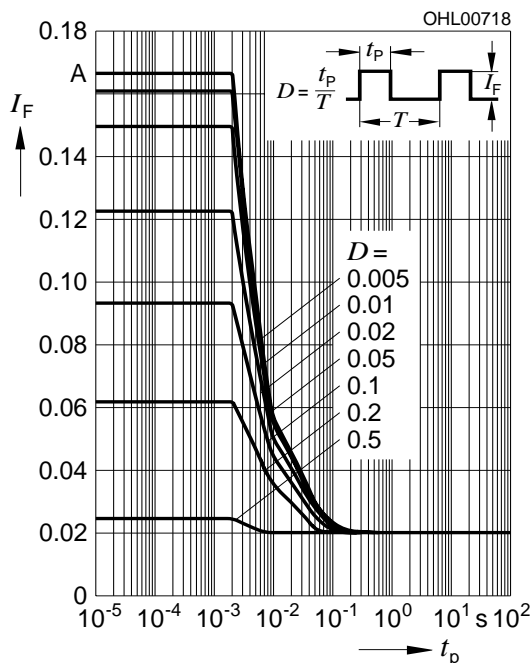
**Zulässige Impulsbelastbarkeit  $I_F = f(t_p)$**   
**Permissible Pulse Handling Capability**  
 Duty cycle  $D =$  parameter,  $T_A = 25\text{ °C}$   
 blue (1 Chip on)



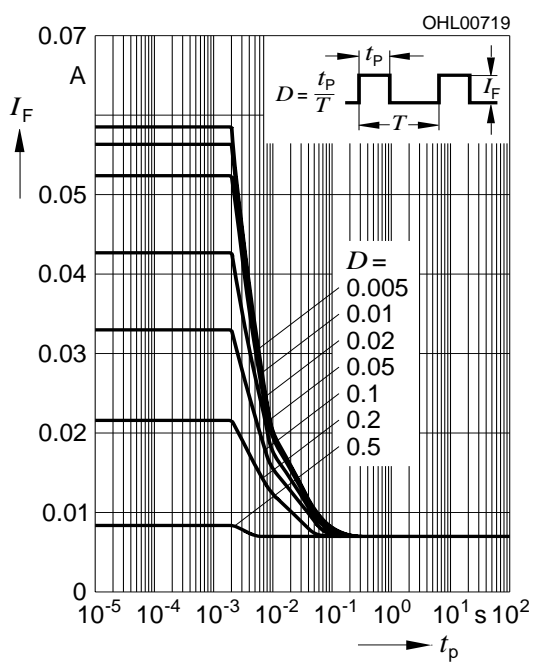
**Zulässige Impulsbelastbarkeit  $I_F = f(t_p)$**   
**Permissible Pulse Handling Capability**  
 Duty cycle  $D =$  parameter,  $T_A = 85\text{ °C}$   
 blue (1 Chip on)

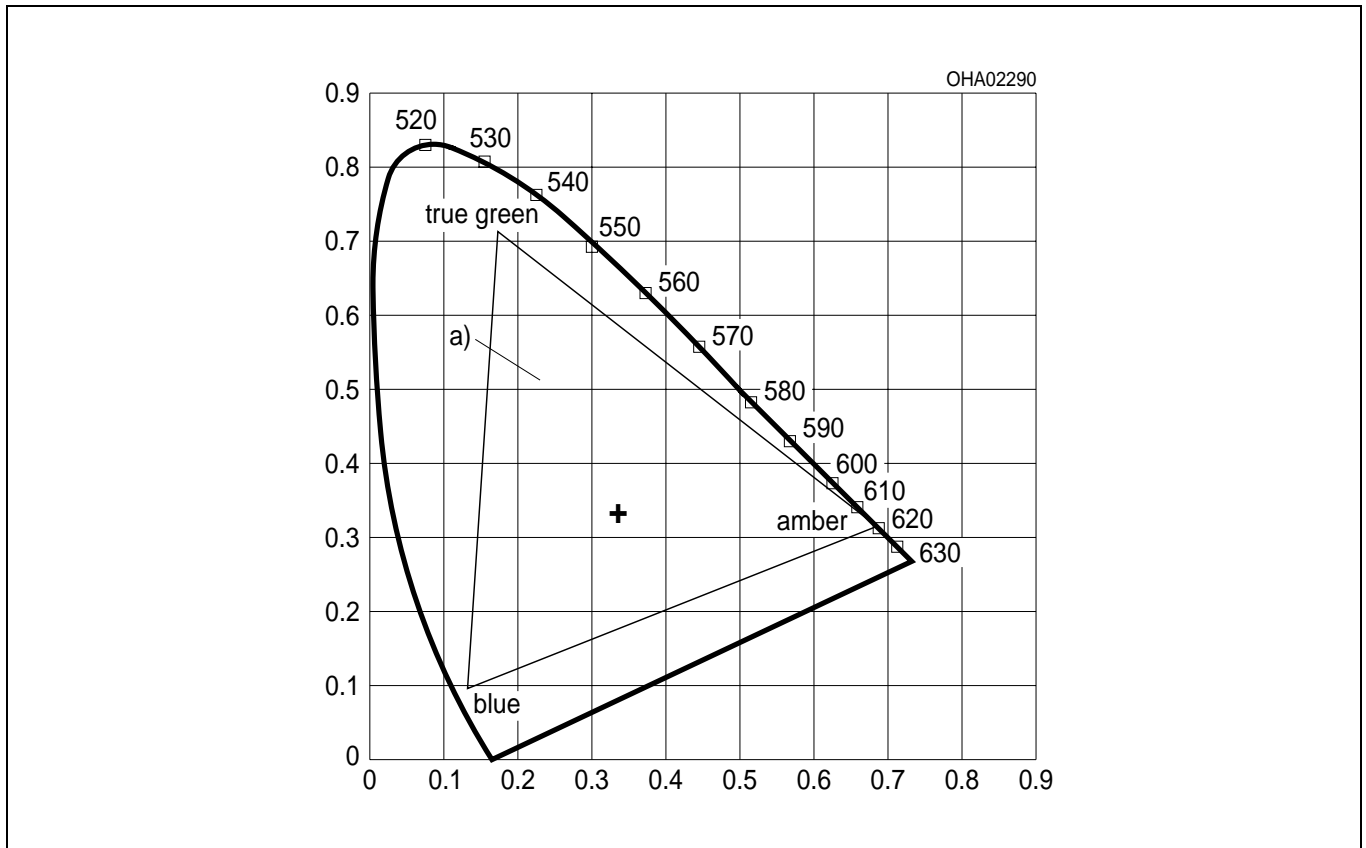


**Zulässige Impulsbelastbarkeit  $I_F = f(t_p)$**   
**Permissible Pulse Handling Capability**  
 Duty cycle  $D =$  parameter,  $T_A = 25\text{ °C}$   
 blue (3 Chips on)



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





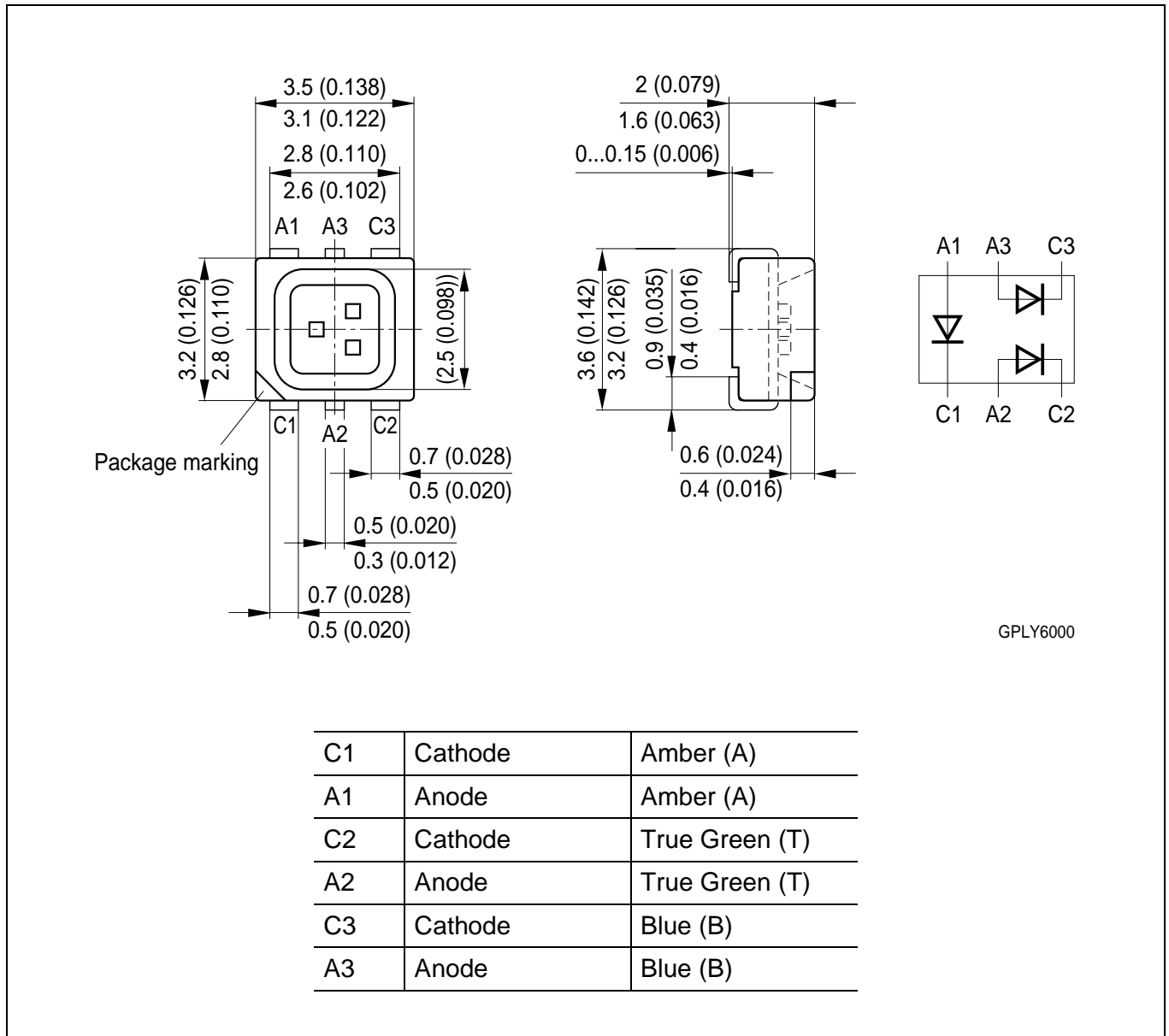
Die Farbkoordinaten des Mischlichtes können innerhalb des mit a) gekennzeichneten Bereichs des Farbdreiecks erwartet werden.

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



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

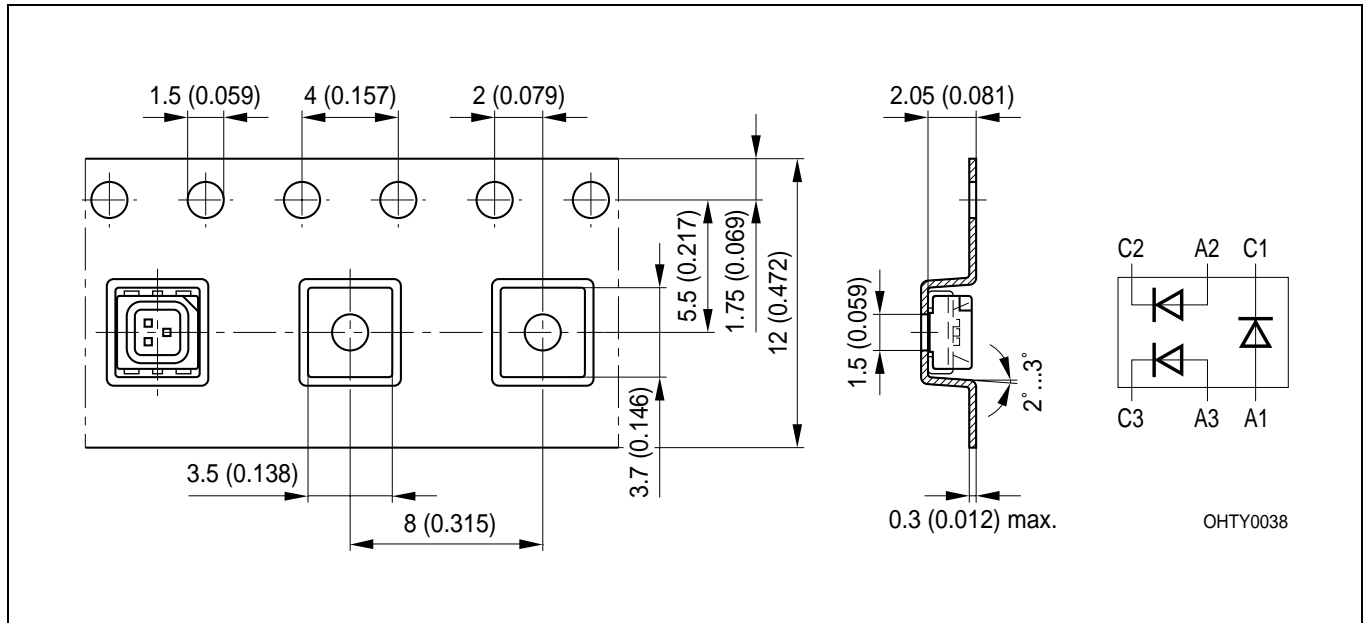
Gewicht / Approx. weight: 40 mg

**Gurtung / Polarität und Lage**

Verpackungseinheit 1000/Rolle, ø180 mm  
 oder 4000/Rolle, ø330 mm

**Method of Taping / Polarity and Orientation**

Packing unit 1000/reel, ø180 mm  
 or 4000/reel, ø330 mm



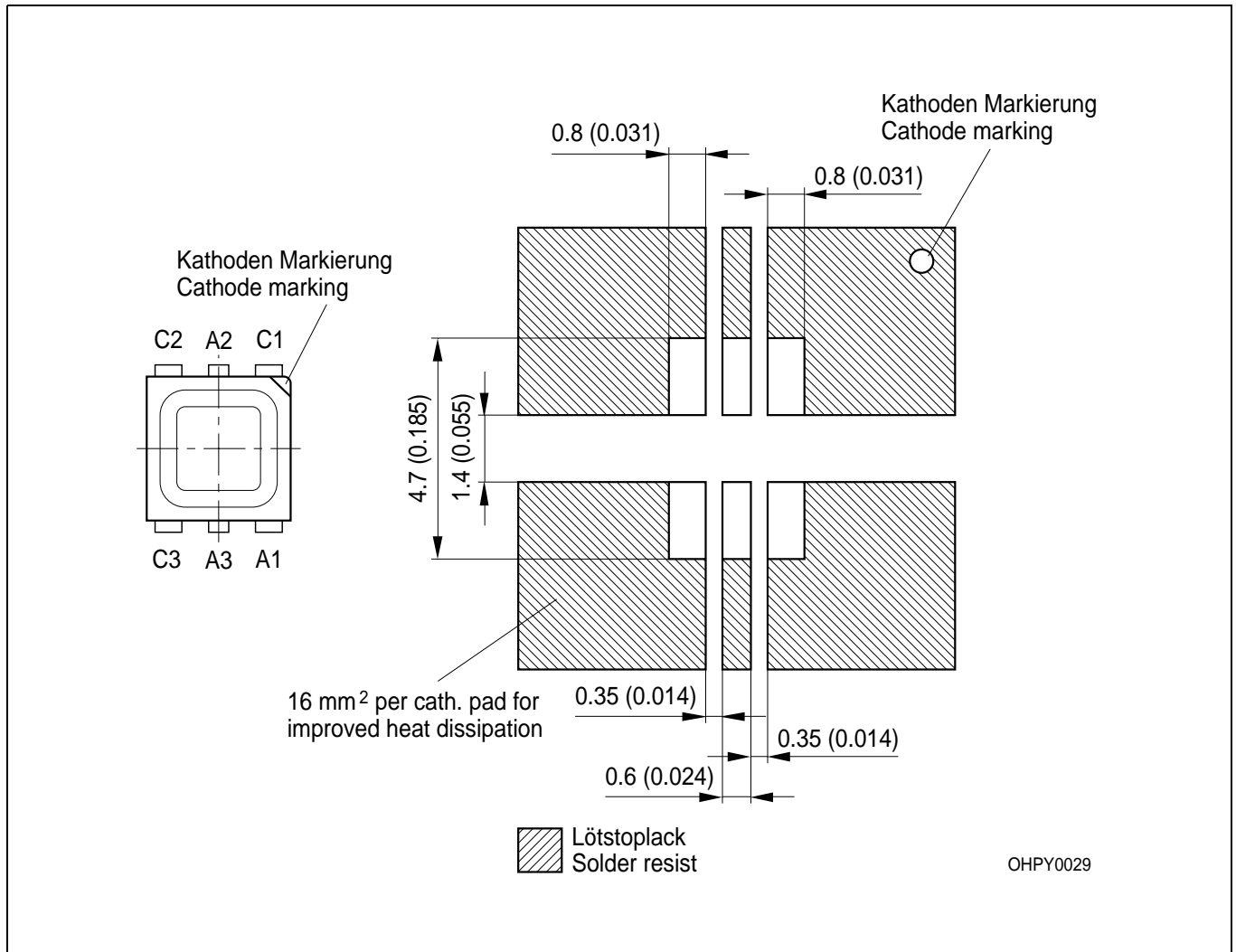
Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

*Anm.: Bezüglich Trockenverpackung finden Sie weitere Hinweise im Internet und in unserem Short Form Catalog im Kapitel "Gurtung und Verpackung" unter dem Punkt "Trockenverpackung". Hier sind Normenbezüge, unter anderem ein Auszug der JEDEC-Norm, enthalten.*

*Note: Regarding dry pack you will find further information in the internet and in the Short Form Catalog in chapter "Tape and Reel" under the topic "Dry Pack". Here you will also find the normative references like JEDEC. Lötbedingungen Vorbehandlung nach JEDEC Level 2 Soldering Conditions Preconditioning acc. to JEDEC Level 2*

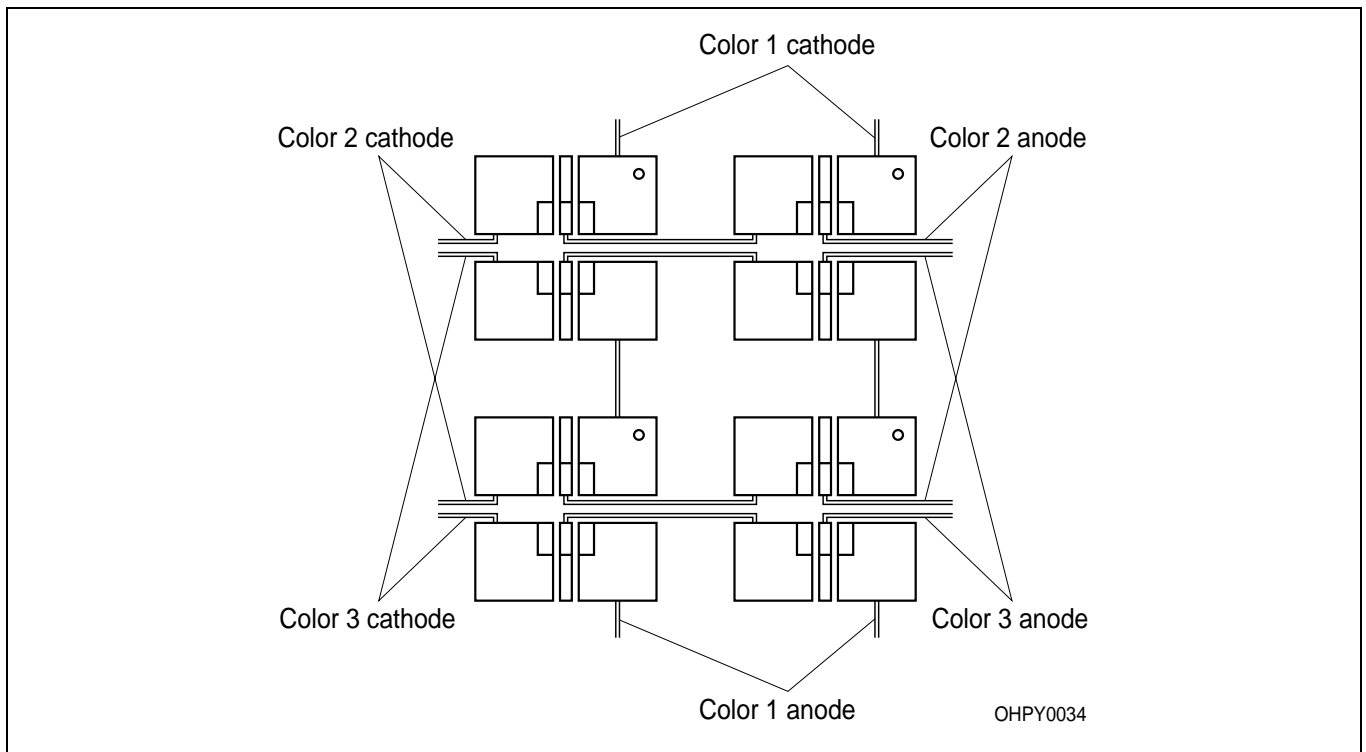


**Empfohlenes Lötpad Design** IR Reflow Löten  
**Recommended Solder Pad** IR Reflow Soldering



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

**Empfohlenes Platinendesign für cluster mit 6-lead TOPLED® in Serienschaltung**  
**Recommended PCB-Design for cluster with 6-lead TOPLED® in Series Connection**

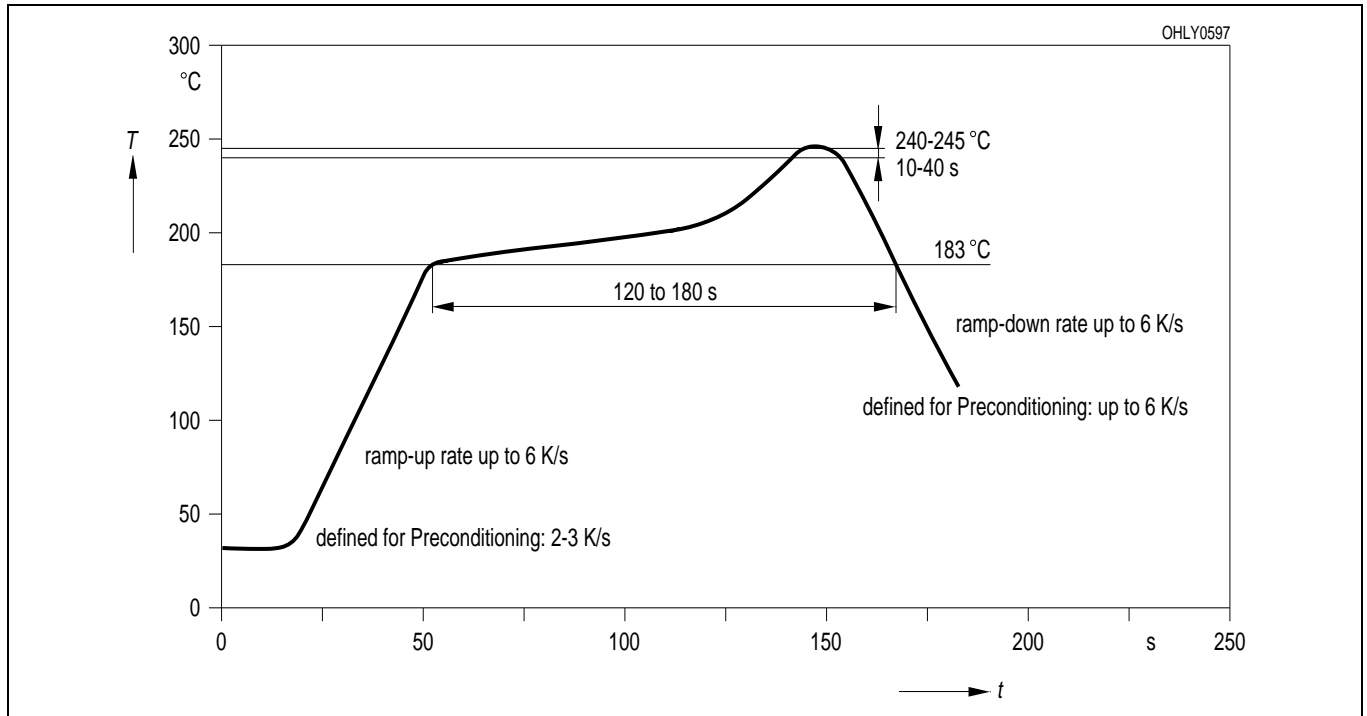


**Lötbedingungen**  
**Soldering Conditions**

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

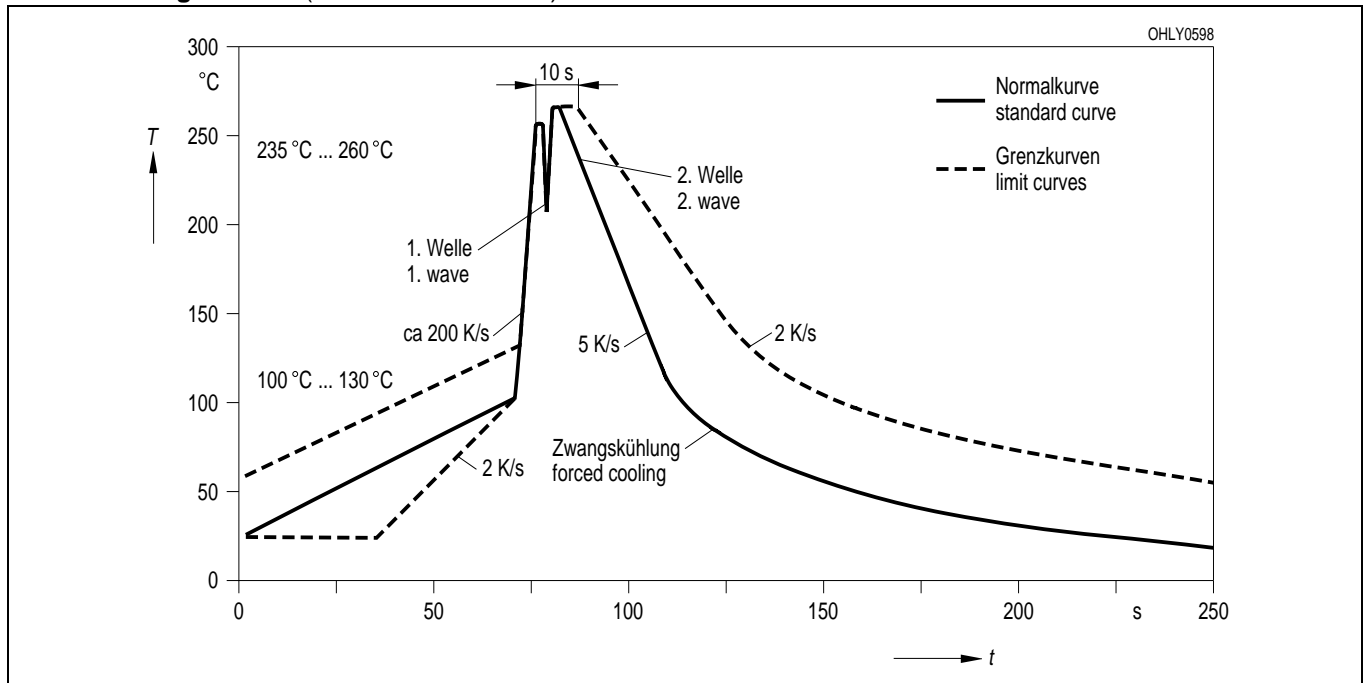
**IR-Reflow Lötprofil**  
**IR Reflow Soldering Profile**

(nach IPC 9501)  
(acc. to IPC 9501)



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

(nach CECC 00802)  
(acc. to CECC 00802)



Revision History: 2003-11-17		Date of change
Previous Version: 2003-10-29		
Page	Subjects (major changes)	
9	true green and blue: new dominant wavelength diagrams	2002-12-17
2, 5	new luminous intensity groups	2003-02-11
7	diagram forward current OHL01382 replaced by OHL00590	2003-02-12
14	note: dry pack	2003-08-27
1	ESD norm	2003-08-27
3	ambient temperature	2003-08-27
2, 5	new luminous intensity groups	2003-10-10
2	new ordering codes	2003-10-29

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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 <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 the 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.