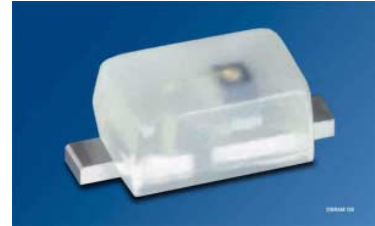


SmartLED™ Hyper-Bright LED

LT L893

Abgekündigt nach OS-PD-2003-007 - wird durch
LT L89S ersetzt werden
Obsolete acc. to OS-PD-2003-007 - will be
replaced by LT L89S



Besondere Merkmale

- **Gehäusetyp:** SMT Gehäuse SCD 80, farbloser diffuser Verguss
- **Besonderheit des Bauteils:** kleinste Bauform 1,7 x 0,8 x 0,65 mm (LxBxH)
- **Wellenlänge:** 528 nm (true green)
- **Abstrahlwinkel:** 160°
- **Technologie:** InGaN
- **optischer Wirkungsgrad:** 8 lm/W
- **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 5000/Rolle bzw. 10000/Rolle, ø180 mm
- **ESD-Festigkeit:** ESD-sicher bis 2 kV nach JESD22-A114-B

Anwendungen

- flache Hinterleuchtung (LCD, Mobile Phone, Schalter, Display)
- Spielsachen
- Informationsanzeigen im Aussenbereich
- Signal- und Symbolleuchten
- Markierungsbeleuchtung (Stufen, Fluchtwege u. ä.)

Features

- **package:** SMT package SCD 80, colorless diffused resin
- **feature of the device:** smallest package 1.7 x 0.8 x 0.65 mm (LxWxH)
- **wavelength:** 528 nm (true green)
- **viewing angle:** 160°
- **technology:** InGaN
- **optical efficiency:** 8 lm/W
- **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 5000/reel resp. 10000/reel, ø180 mm
- **ESD-withstand voltage:** up to 2 kV acc. to JESD22-A114-B

Applications

- flat backlighting (LCD, cellular phones, switches, displays)
- toys
- outdoor displays
- signal and symbol luminary
- marker lights (e.g. steps, exit ways, etc.)

Typ Type	Emissions- farbe Color of Emission	Lichtstärke Luminous Intensity $I_F = 20 \text{ mA}$ $I_V \text{ (mcd)}$	Lichtstrom Luminous Flux $I_F = 20 \text{ mA}$ $\Phi_V \text{ (mlm)}$	Bestellnummer Ordering Code
■LT L893-P1Q1-35	true green	45.0 ... 90.0	270 (typ.)	Q62703Q6157
■LT L893-Q1R2-35		71.0 ... 180.0	500 (typ.)	Q62703Q6158

- Abgekündigt nach OS-PD-2003-007 - wird durch LT L89S ersetzt werden
 Obsolete acc. to OS-PD-2003-007 - will be replaced by LT L89S
 Letzte Bestellung / Last Order: 2004-02-28
 Letzte Lieferung / Last Delivery: 2004-08-31

Anm.: -35 gesamter Farbbereich, Lieferung in Einzelgruppen (siehe Seite 5)

*Die Standardlieferform von Serientypen beinhaltet eine untere bzw. eine obere Familiengruppe. Diese besteht aus 3 bzw. 4 Helligkeitshalbgruppen. Einzelne Helligkeitshalbgruppen sind nicht bestellbar.
 In einer Verpackungseinheit / Gurt ist immer nur eine Helligkeitshalbgruppe enthalten.*

Note: -35 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 luminous intensity half groups. Individual luminous intensity half groups cannot be ordered.
 No packing unit / tape ever contains more than one luminous intensity half group.*

Grenzwerte
Maximum Ratings

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Betriebstemperatur Operating temperature range	T_{op}	- 40 ... + 100	°C
Lagertemperatur Storage temperature range	T_{stg}	- 40 ... + 100	°C
Sperrschichttemperatur Junction temperature	T_j	+ 110	°C
Durchlassstrom Forward current ($T_A=25^\circ\text{C}$)	I_F	20	mA
Stoßstrom Surge current $t = 10 \mu\text{s}, D = 0.1, T_A=25^\circ\text{C}$	I_{FM}	250	mA
Sperrspannung ¹⁾ Reverse voltage ($T_A=25^\circ\text{C}$)	V_R	5	V
Leistungsaufnahme Power consumption ($T_A=25^\circ\text{C}$)	P_{tot}	80	mW
Wärmewiderstand Thermal resistance Sperrschicht/Umgebung ²⁾ Junction/ambient ²⁾	$R_{th JA}$	450	K/W
Sperrschicht/Löt看pad Junction/solder point	$R_{th JS}$	260	K/W

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

²⁾ Montage auf PC-Board FR 4 (Padgröße $\geq 5 \text{ mm}^2$)
mounted on PC board FR 4 (pad size $\geq 5 \text{ mm}^2$)

Kennwerte ($T_A = 25\text{ °C}$)

Characteristics

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Wellenlänge des emittierten Lichtes Wavelength at peak emission $I_F = 20\text{ mA}$	(typ.) λ_{peak}	523	nm
Dominantwellenlänge ¹⁾ Dominant wavelength $I_F = 20\text{ mA}$	λ_{dom}	528 ± 9	nm
Spektrale Bandbreite bei 50 % $I_{\text{rel max}}$ Spectral bandwidth at 50 % $I_{\text{rel max}}$ $I_F = 20\text{ mA}$	(typ.) $\Delta\lambda$	33	nm
Abstrahlwinkel bei 50 % I_V (Vollwinkel) Viewing angle at 50 % I_V	(typ.) 2ϕ	160	Grad deg.
Durchlassspannung ²⁾ Forward voltage $I_F = 20\text{ mA}$	(min.) V_F (typ.) V_F (max.) V_F	2.9 3.3 3.9	V V V
Sperrstrom Reverse current $V_R = 5\text{ V}$	(typ.) I_R (max.) I_R	0.01 10	μA μA
Temperaturkoeffizient von λ_{peak} Temperature coefficient of λ_{peak} $I_F = 20\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$	(typ.) $TC_{\lambda_{\text{peak}}}$	0.04	nm/K
Temperaturkoeffizient von λ_{dom} Temperature coefficient of λ_{dom} $I_F = 20\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$	(typ.) $TC_{\lambda_{\text{dom}}}$	0.03	nm/K
Temperaturkoeffizient von V_F Temperature coefficient of V_F $I_F = 20\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$	(typ.) TC_V	- 4.5	mV/K
Optischer Wirkungsgrad Optical efficiency $I_F = 20\text{ mA}$	(typ.) η_{opt}	8	lm/W

¹⁾ Wellenlängen werden mit einer Stromeinprägedauer von 25 ms und einer Genauigkeit von $\pm 1\text{ nm}$ ermittelt.
Wavelength groups are tested at a current pulse duration of 25 ms and a tolerance of $\pm 1\text{ nm}$.

²⁾ Durchlassspannungswerte werden mit einer Stromeinprägedauer von 1 ms und einer Genauigkeit von $\pm 0,05\text{ V}$ ermittelt.
Forward voltage groups are tested at a current pulse duration of 1 ms and a tolerance of $\pm 0.05\text{ V}$.

¹⁾ Wellenlängengruppen (Dominantwellenlänge)
Wavelength groups (dominant wavelength)

Gruppe Group	Wellenlänge Wavelength		Einheit Unit
	min.	max.	
3	519	525	nm
4	525	531	nm
5	531	537	nm

Helligkeits-Gruppierungsschema
Luminous Intensity Groups

Lichtgruppe Luminous Intensity Group	Lichtstärke Luminous Intensity I_V (mcd)	Lichtstrom Luminous Flux Φ_V (lm)
P1	45 ... 56	200 (typ.)
P2	56 ... 71	250 (typ.)
Q1	71 ... 90	320 (typ.)
Q2	90 ... 112	400 (typ.)
R1	112 ... 140	500 (typ.)
R2	140 ... 180	640 (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: R2-3

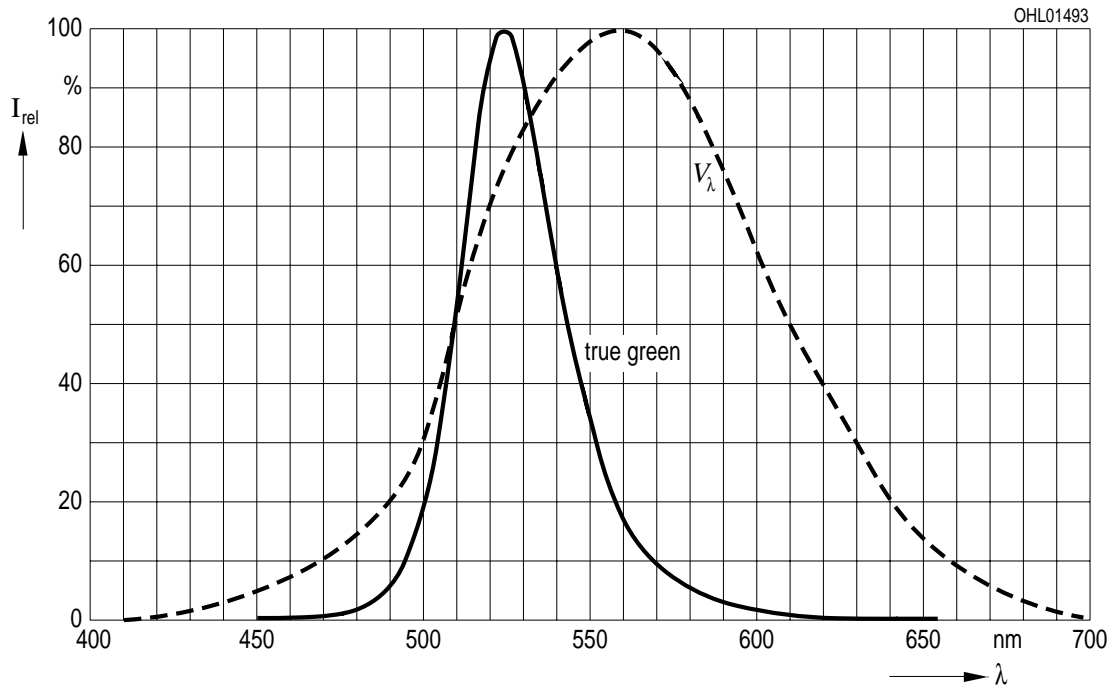
Example: R2-3

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

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

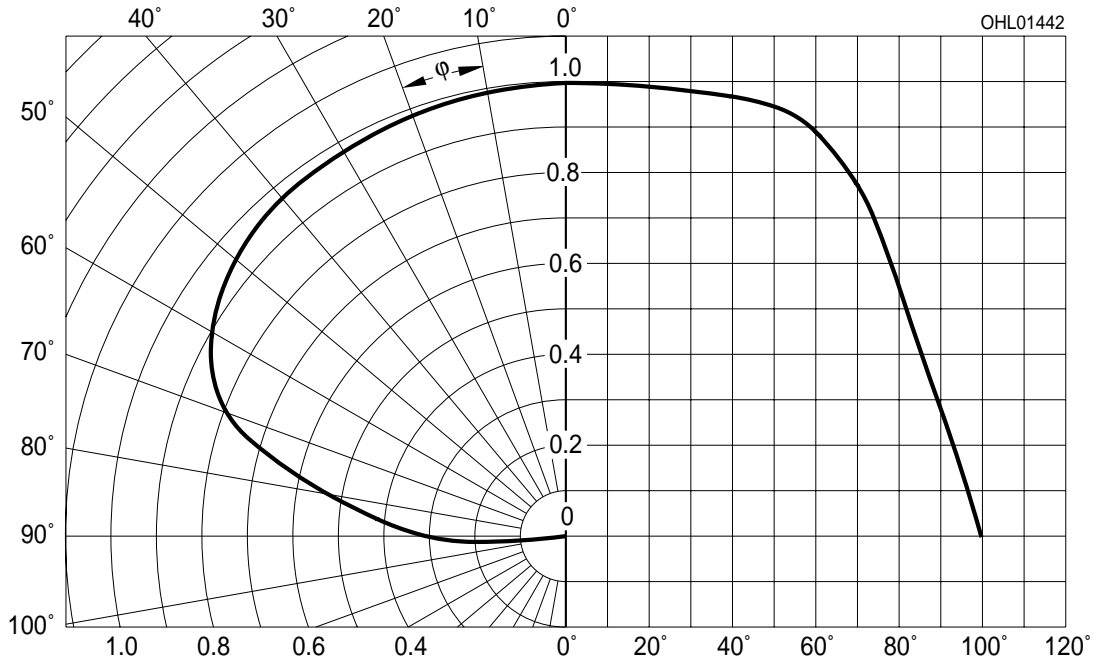
Relative Spectral Emission

$V(\lambda)$ = spektrale Augenempfindlichkeit
Standard eye response curve



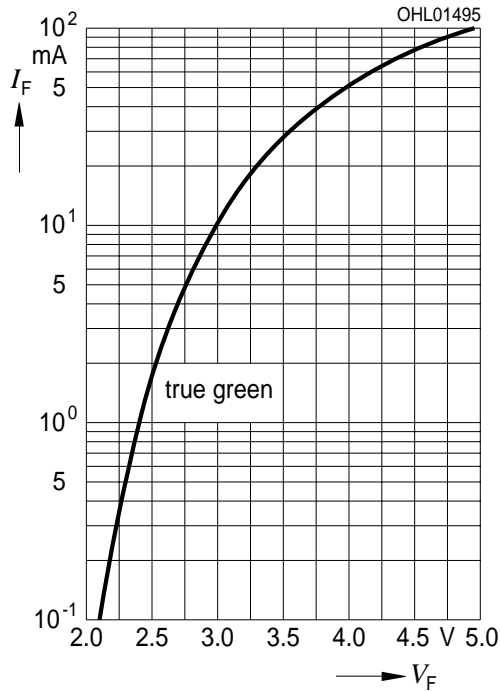
Abstrahlcharakteristik $I_{rel} = f(\varphi)$

Radiation Characteristic



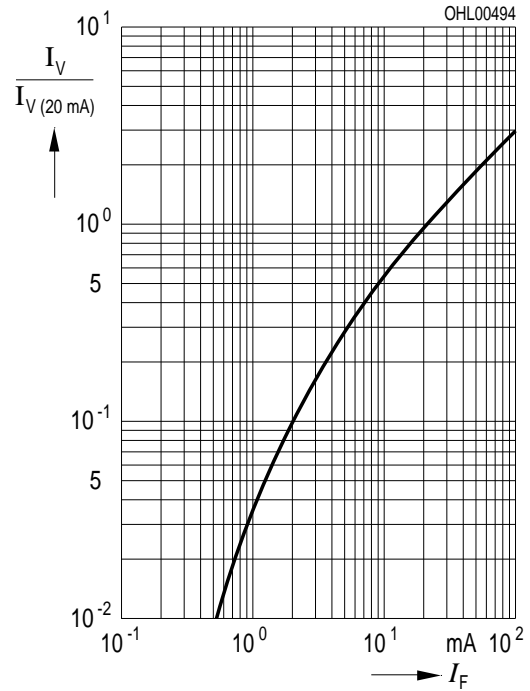
Durchlassstrom $I_F = f(V_F)$
Forward Current

$T_A = 25\text{ }^\circ\text{C}$

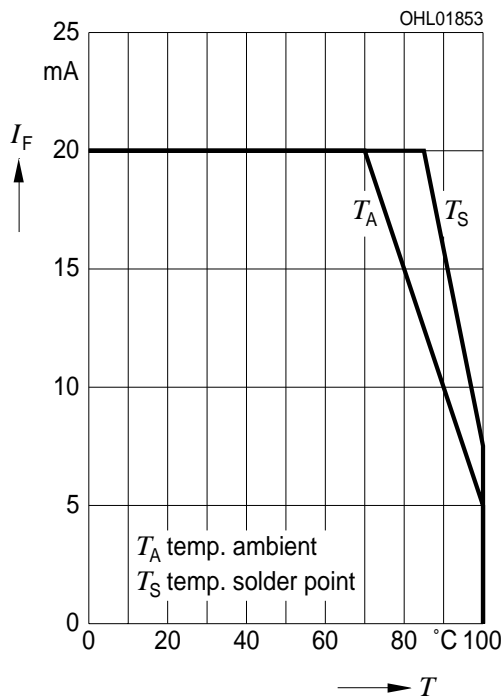


Relative Lichtstärke $I_V/I_{V(20\text{ mA})} = f(I_F)$
Relative Luminous Intensity

$T_A = 25\text{ }^\circ\text{C}$

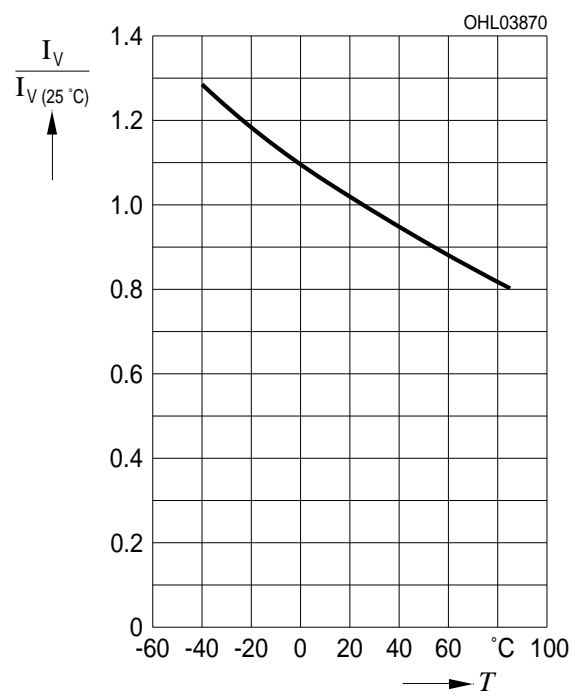


Maximal zulässiger Durchlassstrom $I_F = f(T_A)$
Max. Permissible Forward Current



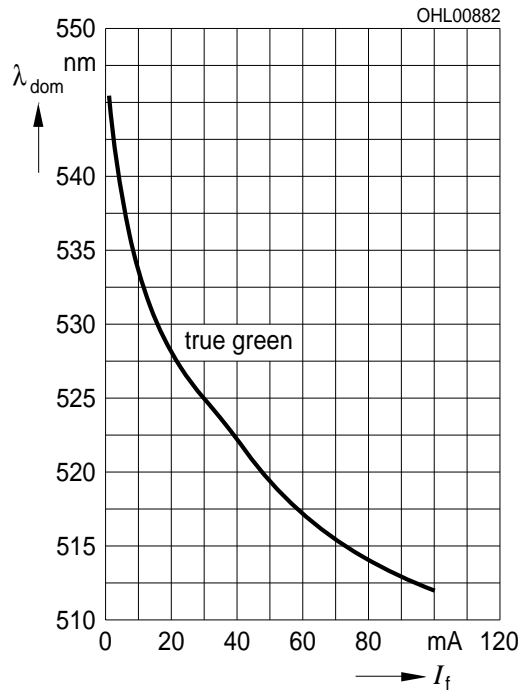
Relative Lichtstärke $I_V/I_{V(25\text{ }^\circ\text{C})} = f(T_A)$
Relative Luminous Intensity

$I_F = 20\text{ mA}$

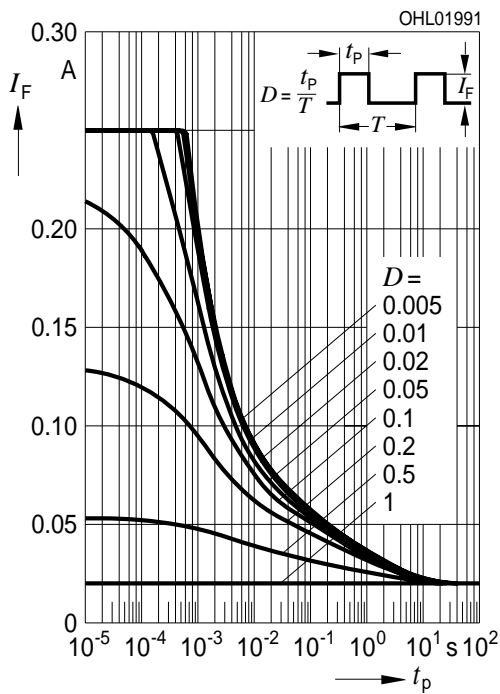


Dominante Wellenlänge $\lambda_{\text{dom}} = f(I_F)$
Dominant wavelength

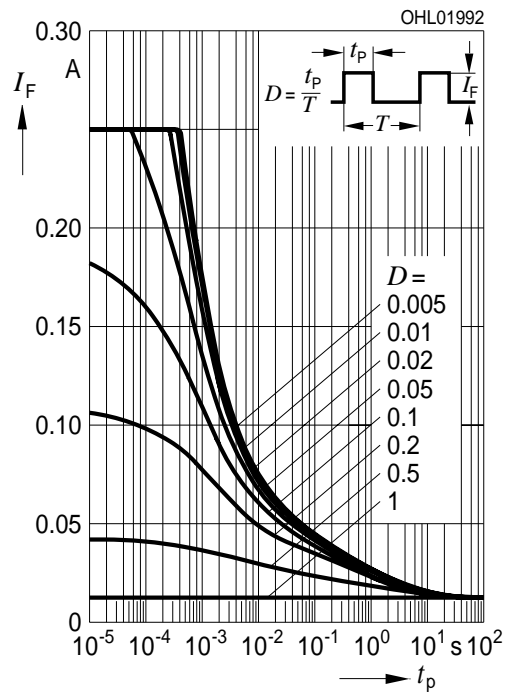
$T_A = 25\text{ °C}$



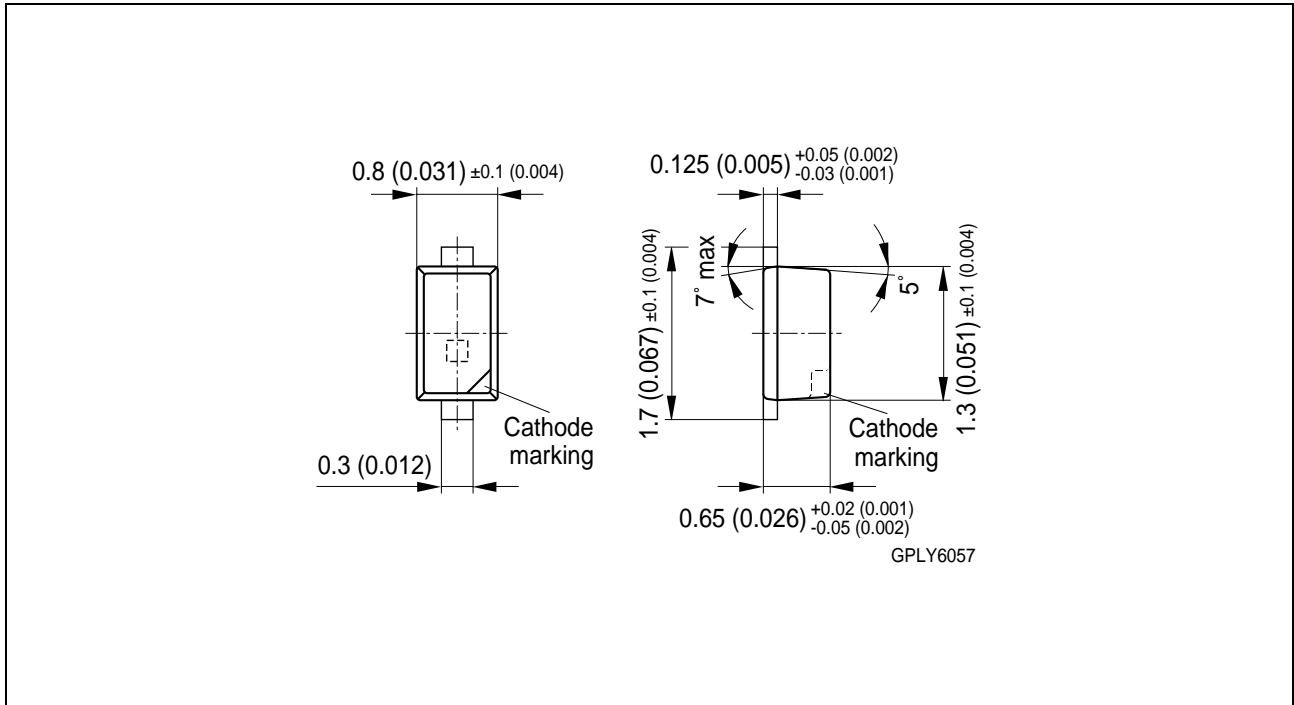
Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability
 Duty cycle $D =$ parameter, $T_A = 25\text{ °C}$



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



**Maßzeichnung
Package Outlines**

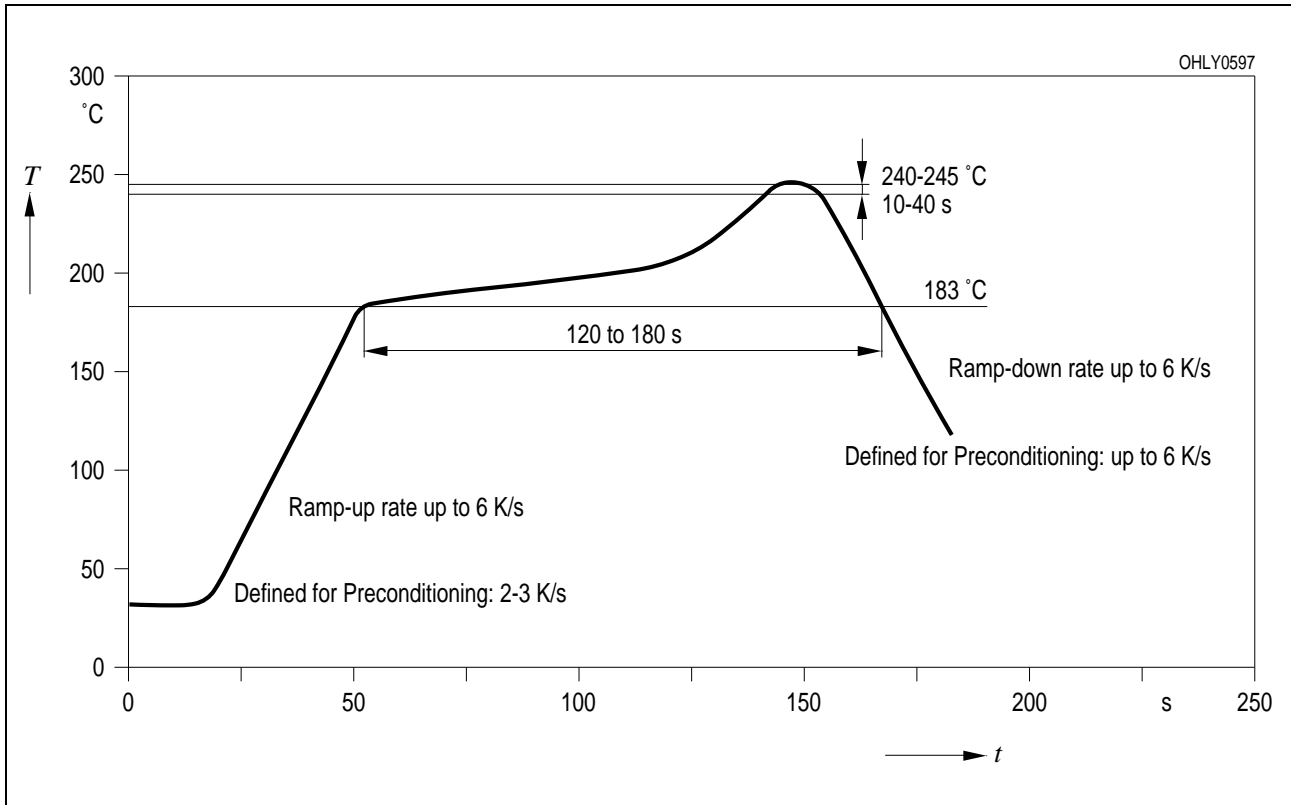


Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

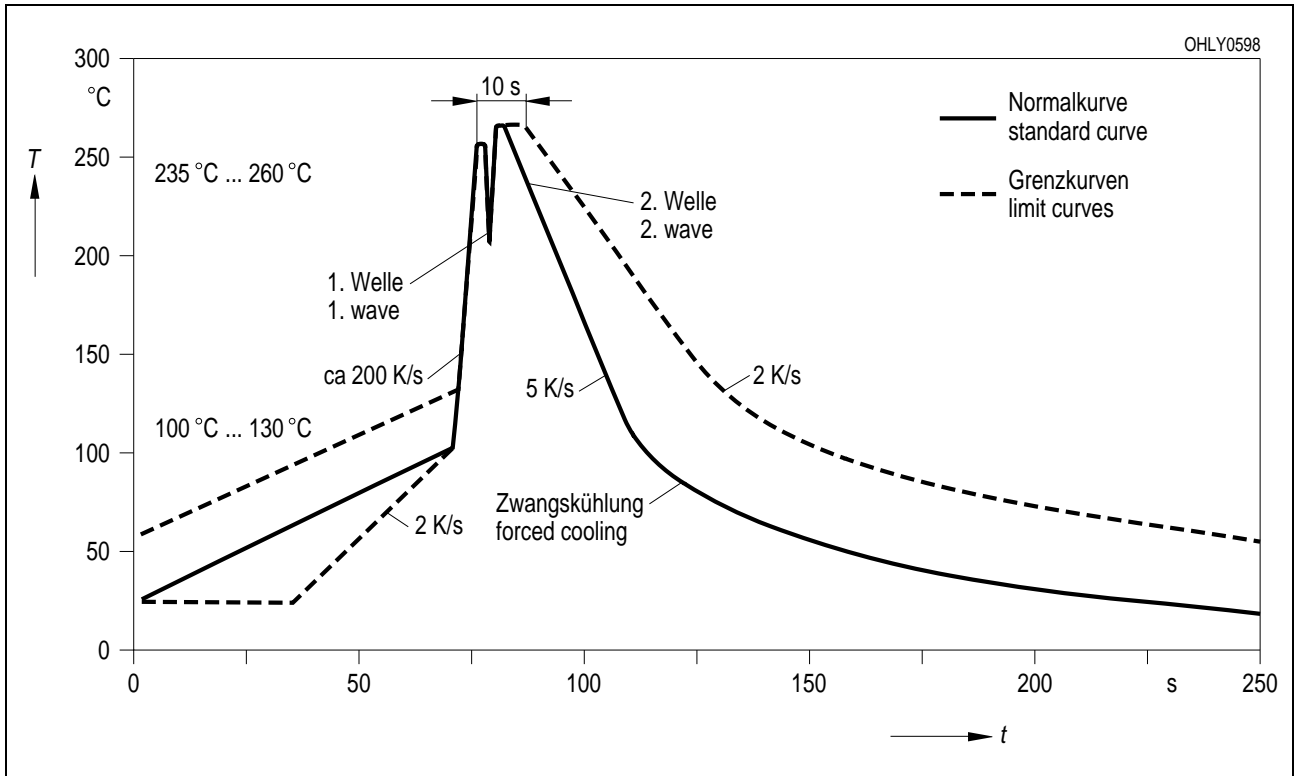
Gewicht / Approx. weight: 1,4 mg

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

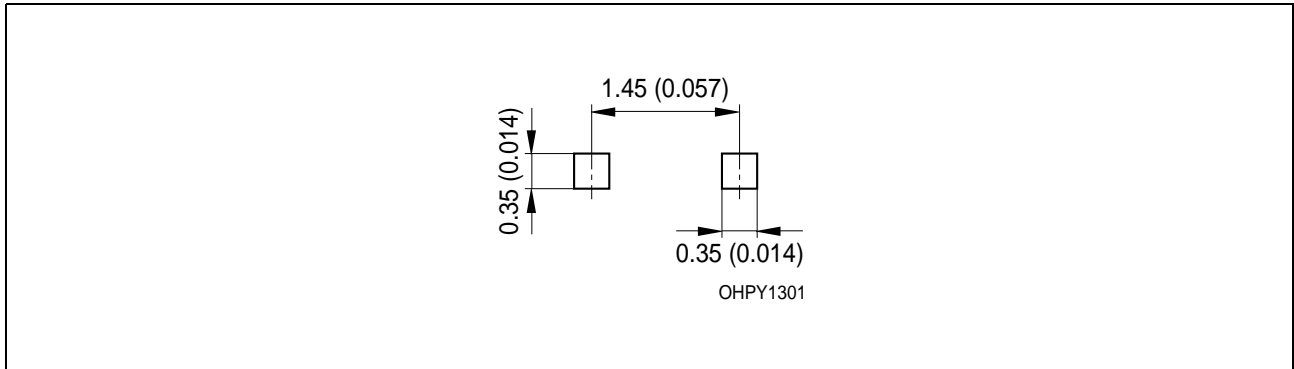
IR-Reflow Lötprofil (nach CECC 00802)
IR Reflow Soldering Profile (acc. to CECC 00802)



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

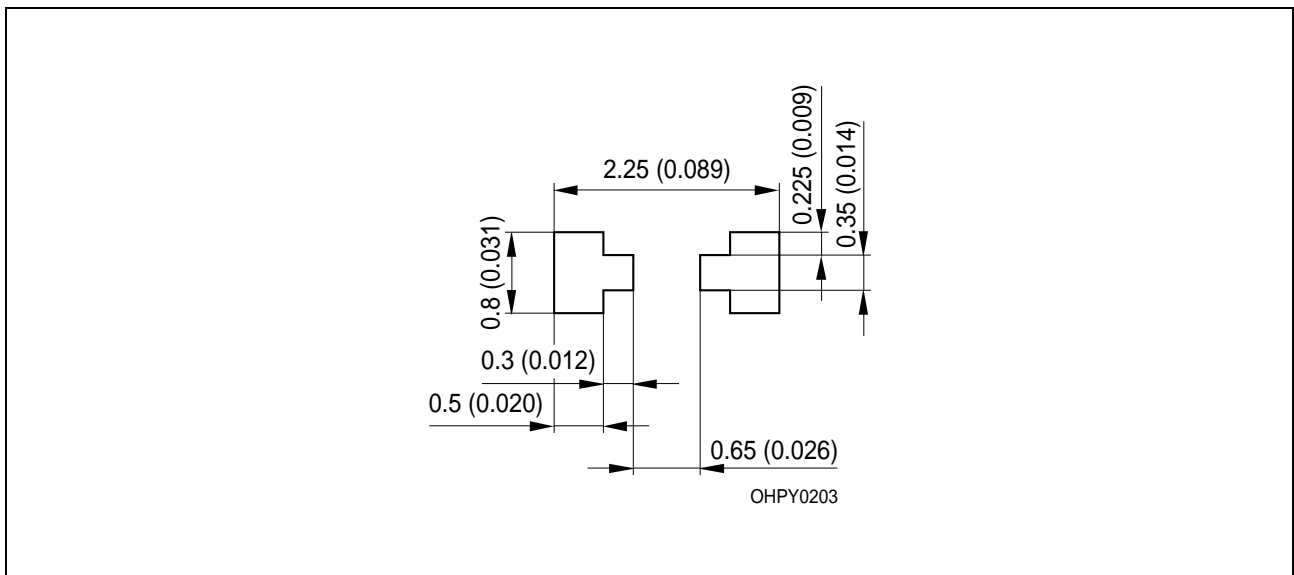


Empfohlenes Lötpad design IR Reflow Lötén
Recommended Solder Pad IR Reflow Soldering



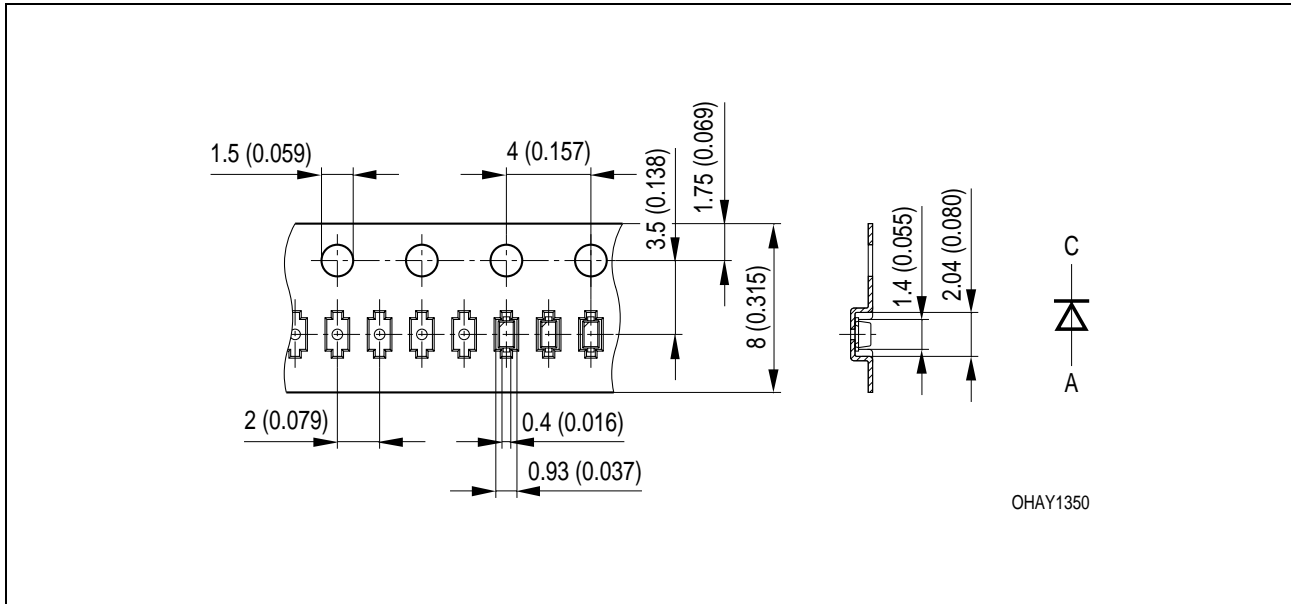
Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).
 Gehäuse hält TTW-Löthitze aus / Package able to withstand TTW-soldering heat

Empfohlenes Lötpad design verwendbar für SmartLED™ und Chiplid - Bauform 0603
 IR Reflow Lötén
Recommended Solder Pad useable for SmartLED™ and Chiplid - Package 0603
 IR Reflow Soldering



Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).
 Empfohlene Lötpastendicke: 120 µm / recommended thickness of solder paste: 120 µm
 Gehäuse für Wellenlötén (TTW) geeignet / Package suitable for TTW-soldering

Gurtung / Polarität und Lage
Method of Taping / Polarity and Orientation



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

Verpackungseinheit:

- 8 mm Gurt mit 5000/Rolle, ø180 mm
- 8 mm Gurt mit 10000/Rolle, ø180 mm (auf Anfrage)

Packing unit:

- 8 mm tape with 5000/reel, ø180 mm
- 8 mm tape with 10000/reel, ø180 mm (on request)

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.

Revision History: 2003-09-15		Date of change
Previous Version: 2003-08-28		
Page	Subjects (major changes since last revision)	
2	changed resin from colorless clear to colorless diffused	
3	Junction temperature	
4	value (forward voltage)	
12	recommended solder pad	
3	power consumption from 85 mW to 80 mW	
2	wavelength grouping for true green	
3	pad size from 16 mm ² to 5 mm ²	
14	annotations	2002-07-25
3	reverse voltage (footnote)	2002-08-21
2	not for new design	2002-09-16
1, 13	tape with 5000/reel and 10000/reel instead of 10000	2002-12-10
4	temperature coefficient of V_F	2003-05-12
7	diagram max. perm. forward current	2003-06-16
9	new diagrams pulse derating	2003-06-30
1, 2	obsolete	2003-08-28
14	note: dry pack	2003-09-15
3	ambient temperature	2003-09-15
1	ESD-withstand voltage	2003-09-15

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