

Power TOPLED® Enhanced optical Power LED (ATON®)

LB E67C, LV E67C, LT E67C



Vorläufige Daten / Preliminary Data

Besondere Merkmale

- **Gehäusotyp:** weißes P-LCC-4 Gehäuse
- **Besonderheit des Bauteils:** mehr Licht durch erhöhten optischen Wirkungsgrad; höhere Umgebungstemperatur bei gleichem Strom im Vergleich zur TOPLED® möglich
- **Wellenlänge:** 469 nm (blau), 503 nm (verde), 525 nm (true green)
- **Abstrahlwinkel:** Lambertscher Strahler (120°)
- **Technologie:** InGaN
- **optischer Wirkungsgrad:** 3 lm/W (blau), 10 lm/W (verde), 13 lm/W (true green)
- **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 2000/Rolle, ø180 mm oder 8000/Rolle, ø330 mm
- **ESD-Festigkeit:** ESD-sicher bis 2 kV nach EOS/ESD-5.1-1993

Anwendungen

- Ampelanwendung (verde)
- Hinterleuchtung (LCD, Schalter, Tasten, Displays, Werbebeleuchtung, Allgemeinbeleuchtung)
- Innenbeleuchtung im Automobilbereich (z.B. Instrumentenbeleuchtung, u. ä.)
- Ersatz von Kleinst-Glühlampen
- Markierungsbeleuchtung (z.B. Stufen, Fluchtwege, u.ä.)
- Signal- und Symbolleuchten
- Scanner

Features

- **package:** white P-LCC-4 package
- **feature of the device:** more light due to higher optical efficiency; higher ambient temperature at the same current possible compared to TOPLED®
- **wavelength:** 469 nm (blue), 503 nm (verde), 525 nm (true green)
- **viewing angle:** Lambertian Emitter (120°)
- **technology:** InGaN
- **optical efficiency:** 3 lm/W (blue), 10 lm/W (verde), 13 lm/W (true green)
- **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 2000/reel, ø180 mm or 8000/reel, ø330 mm
- **ESD-withstand voltage:** up to 2 kV acc. to EOS/ESD-5.1-1993

Applications

- traffic lights (verde)
- backlighting (LCD, switches, keys, displays, illuminated advertising, general lighting)
- interior automotive lighting (e.g. dashboard backlighting, etc.)
- substitution of micro incandescent lamps
- marker lights (e.g. steps, exit ways, etc.)
- signal and symbol luminaire
- scanners

| Typ | Emissions- farbe | Farbe der Lichtaustritts- fläche | Lichtstärke | Lichtstrom | Bestellnummer |
|-----------------|----------------------|--|---|---|---------------|
| Type | Color of Emission | Color of the Light Emitting Area | Luminous Intensity $I_F = 30 \text{ mA}$ $I_V \text{ (mcd)}$ | Luminous Flux $I_F = 30 \text{ mA}$ $\Phi_V \text{ (mlm)}$ | Ordering Code |
| LB E67C-P2Q2-35 | blue | colorless clear | 56 ... 112 | 250 (typ.) | Q62703-Q6235 |
| LB E67C-Q2S1-35 | | | 90 ... 224 | 470 (typ.) | Q62703-Q6236 |
| LV E67C-S2T2-35 | verde | colorless clear | 224 ... 450 | 1000 (typ.) | Q62703-Q6286 |
| LV E67C-T2V1-35 | | | 355 ... 900 | 1900 (typ.) | Q65110-A0185 |
| LT E67C-S2T2-35 | true green | colorless clear | 224 ... 450 | 1000 (typ.) | Q65110-A0273 |
| LT E67C-T2V1-35 | | | 355 ... 900 | 1900 (typ.) | Q65110-A0274 |

Anm.: -35 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: -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 groups. Individual half groups are not available.
No packing unit / tape ever contains more than one luminous intensity half group.*

Grenzwerte
Maximum Ratings

| Bezeichnung Parameter | Symbol Symbol | Werte Values | | Einheit Unit |
|---|------------------|-----------------|--------|-----------------|
| | | LB | LV, LT | |
| Betriebstemperatur Operating temperature range | T_{op} | – 40 ... + 100 | | °C |
| Lagertemperatur Storage temperature range | T_{stg} | – 40 ... + 100 | | °C |
| Sperrschichttemperatur Junction temperature | T_j | + 110 | + 125 | °C |
| Durchlassstrom Forward current | I_F | 30 | | mA |
| Stoßstrom Surge current $t \leq 10 \mu s, D = 0.005$ | I_{FM} | 200 | 250 | mA |
| Sperrspannung Reverse voltage | V_R | 5 | | V |
| Leistungsaufnahme Power consumption | P_{tot} | 140 | | mW |
| Wärmewiderstand Thermal resistance Sperrschicht/Umgebung Junction/ambient | $R_{th JA}$ | 350 | | K/W |
| Sperrschicht/Lötpad Junction/solder point Montage auf PC-Board FR 4 (Padgröße $\geq 16 \text{ mm}^2$) mounted on PC board FR 4 (pad size $\geq 16 \text{ mm}^2$) | $R_{th JS}$ | 180 | | K/W |

Kennwerte ($T_A = 25\text{ °C}$)**Characteristics**

| Bezeichnung Parameter | Symbol Symbol | Werte Values | | | Einheit Unit |
|---|------------------------------|-----------------|----------------|----------------|--------------------------------|
| | | LB | LV | LT | |
| Wellenlänge des emittierten Lichtes (typ.) Wavelength at peak emission $I_F = 30\text{ mA}$ | λ_{peak} | 464 | 501 | 520 | nm |
| Dominantwellenlänge ¹⁾ (typ.) Dominant wavelength $I_F = 30\text{ mA}$ | λ_{dom} | 469 ± 6 | 503 ± 6 | 525 ± 9 | nm |
| Spektrale Bandbreite bei 50 % $I_{\text{rel max}}$ (typ.) Spectral bandwidth at 50 % $I_{\text{rel max}}$ $I_F = 30\text{ mA}$ | $\Delta\lambda$ | 25 | 30 | 33 | nm |
| Abstrahlwinkel bei 50 % I_V (Vollwinkel) (typ.) Viewing angle at 50 % I_V | 2ϕ | 120 | 120 | 120 | Grad deg. |
| Durchlassspannung ²⁾ (typ.) Forward voltage $I_F = 30\text{ mA}$ | V_F (max.) V_F | 4.1 4.6 | 3.8 4.6 | 3.8 4.6 | V V |
| Sperrstrom (typ.) Reverse current $V_R = 5\text{ V}$ | I_R (max.) I_R | 0.01 10 | 0.01 10 | 0.01 10 | μA μA |
| Temperaturkoeffizient von λ_{peak} (typ.) Temperature coefficient of λ_{peak} $I_F = 30\text{ mA}; -10^\circ\text{C} \leq T \leq 100^\circ\text{C}$ | $TC_{\lambda_{\text{peak}}}$ | 0.05 | 0.03 | 0.04 | nm/K |
| Temperaturkoeffizient von λ_{dom} (typ.) Temperature coefficient of λ_{dom} $I_F = 30\text{ mA}; -10^\circ\text{C} \leq T \leq 100^\circ\text{C}$ | $TC_{\lambda_{\text{dom}}}$ | 0.04 | 0.02 | 0.03 | nm/K |
| Temperaturkoeffizient von V_F (typ.) Temperature coefficient of V_F $I_F = 30\text{ mA}; -10^\circ\text{C} \leq T \leq 100^\circ\text{C}$ | TC_V | - 3.1 | - 3.2 | - 3.6 | mV/K |
| Optischer Wirkungsgrad (typ.) Optical efficiency $I_F = 30\text{ mA}$ | η_{opt} | 3 | 10 | 13 | lm/W |

¹⁾ Wellenlängengruppen 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⁾ Spannungswerte werden mit einer Stromeinprägedauer von 1 ms und einer Genauigkeit von $\pm 0,1\text{ V}$ ermittelt.
Voltages are tested at a current pulse duration of 1 ms and a tolerance of $\pm 0.1\text{ V}$.

1) Wellenlängengruppen / Wavelength groups

| Gruppe Group | blue | | verde | | true green | | Einheit Unit |
|-----------------|------|------|-------|------|------------|------|-----------------|
| | min. | max. | min. | max. | min. | max. | |
| 3 | 463 | 467 | 497 | 501 | 516 | 522 | nm |
| 4 | 467 | 471 | 501 | 505 | 522 | 528 | nm |
| 5 | 471 | 475 | 505 | 509 | 528 | 534 | nm |

Helligkeits-Gruppierungsschema
Luminous Intensity Groups

| Lichtgruppe Luminous Intensity Group | Lichtstärke Luminous Intensity I_V (mcd) | Lichtstrom Luminous Flux Φ_V (lm) |
|---|--|--|
| P2 | 56 ... 71 | 190 (typ.) |
| Q1 | 71 ... 90 | 240 (typ.) |
| Q2 | 90 ... 112 | 300 (typ.) |
| R1 | 112 ... 140 | 380 (typ.) |
| R2 | 140 ... 180 | 480 (typ.) |
| S1 | 180 ... 224 | 600 (typ.) |
| S2 | 224 ... 280 | 760 (typ.) |
| T1 | 280 ... 355 | 950 (typ.) |
| T2 | 355 ... 450 | 1200 (typ.) |
| U1 | 450 ... 560 | 1500 (typ.) |
| U2 | 560 ... 710 | 1900 (typ.) |
| V1 | 710 ... 900 | 2400 (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: S2-3

Example: S2-3

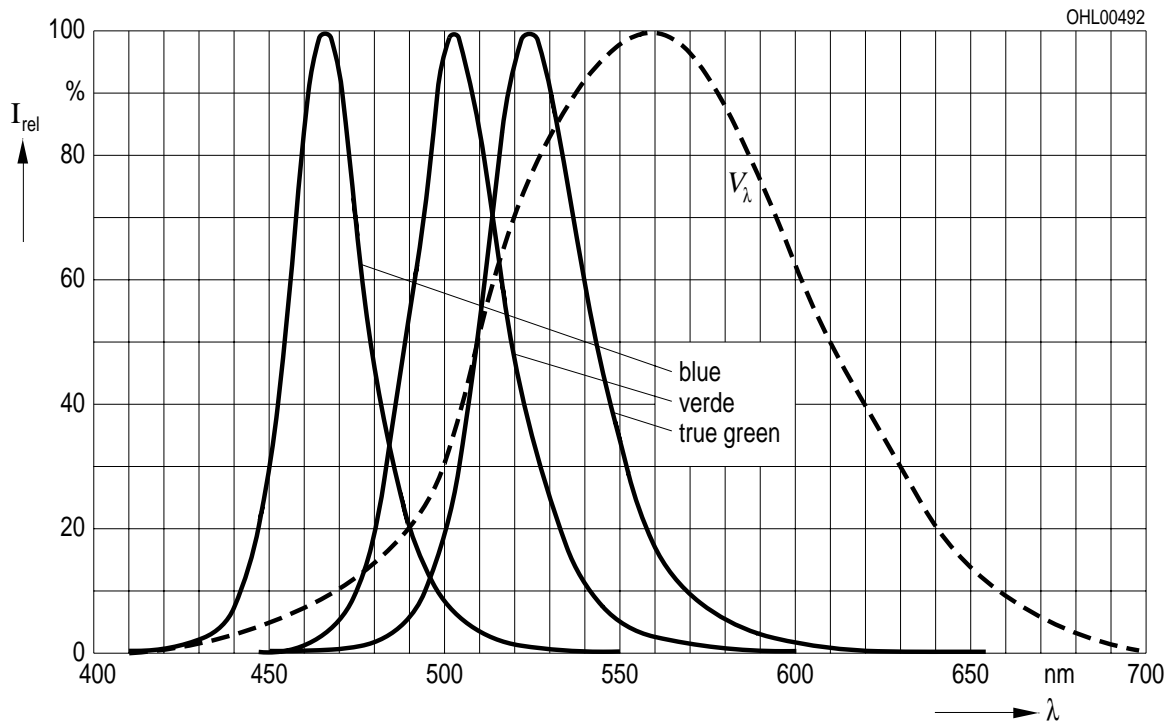
| Lichtgruppe Luminous Intensity Group | Halbgruppe Half Group | Wellenlänge Wavelength |
|---|--------------------------|---------------------------|
| S | 2 | 3 |

Relative spektrale Emission $I_{\text{rel}} = f(\lambda)$, $T_A = 25^\circ\text{C}$, $I_F = 30\text{ mA}$

Relative Spectral Emission

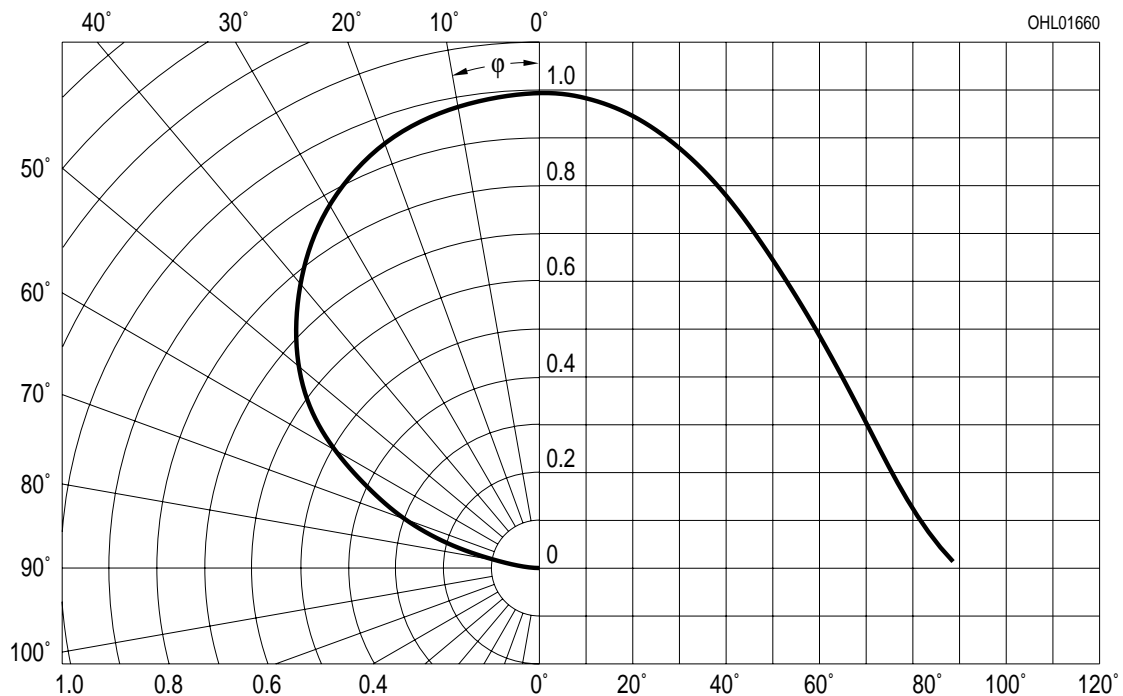
$V(\lambda)$ = spektrale Augenempfindlichkeit

Standard eye response curve



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

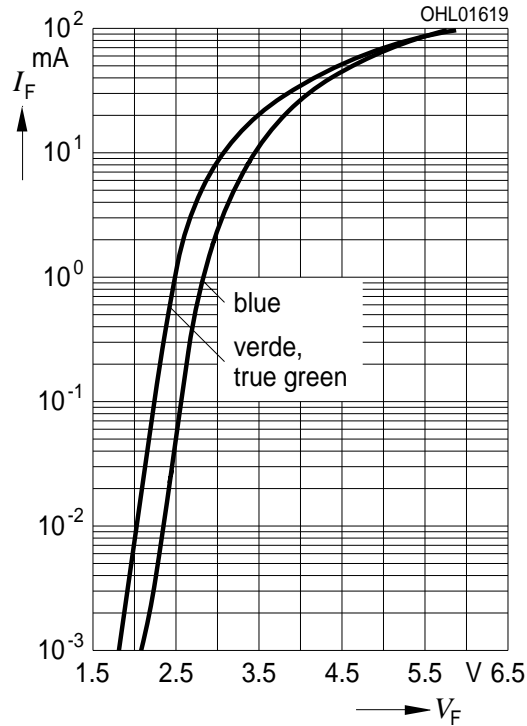
Radiation Characteristic



Durchlassstrom $I_F = f(V_F)$

Forward Current

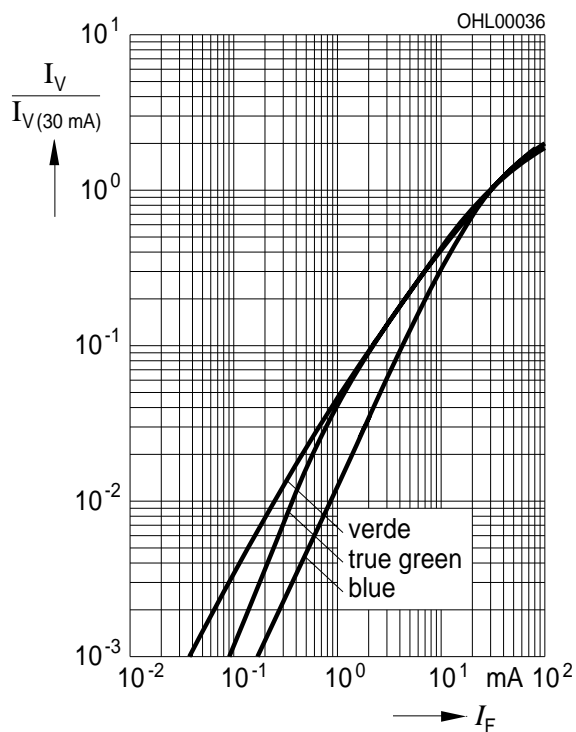
$T_A = 25\text{ °C}$



Relative Lichtstärke $I_V/I_{V(30\text{ mA})} = f(I_F)$

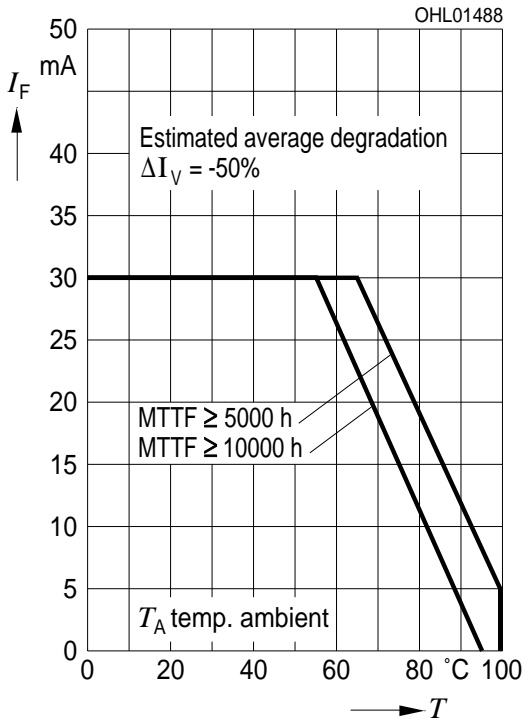
Relative Luminous Intensity

$T_A = 25\text{ °C}$



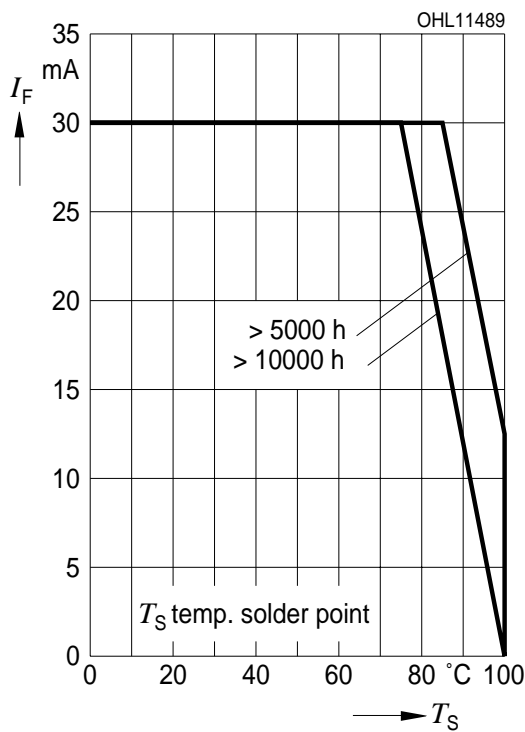
Maximal zulässiger Durchlassstrom $I_F = f(T)$

Max. Permissible Forward Current



Maximal zulässiger Durchlassstrom $I_F = f(T)$

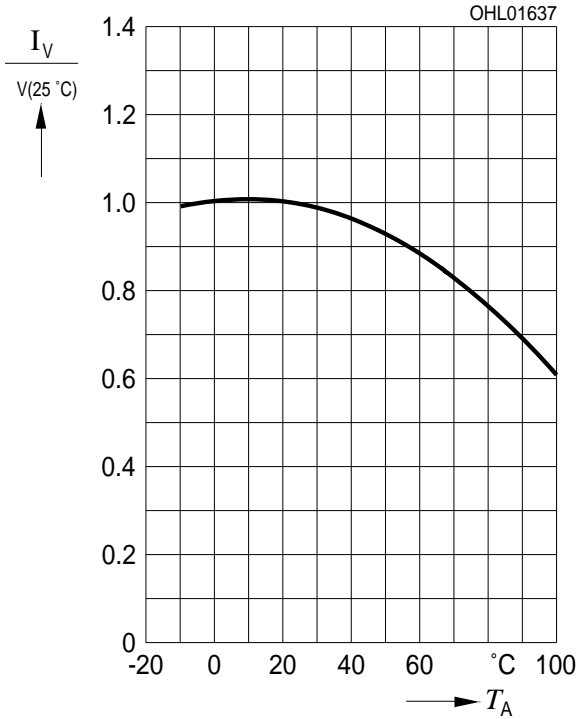
Max. Permissible Forward Current



Relative Lichtstärke $I_V/I_{V(25\text{ °C})} = f(T_A)$

Relative Luminous Intensity

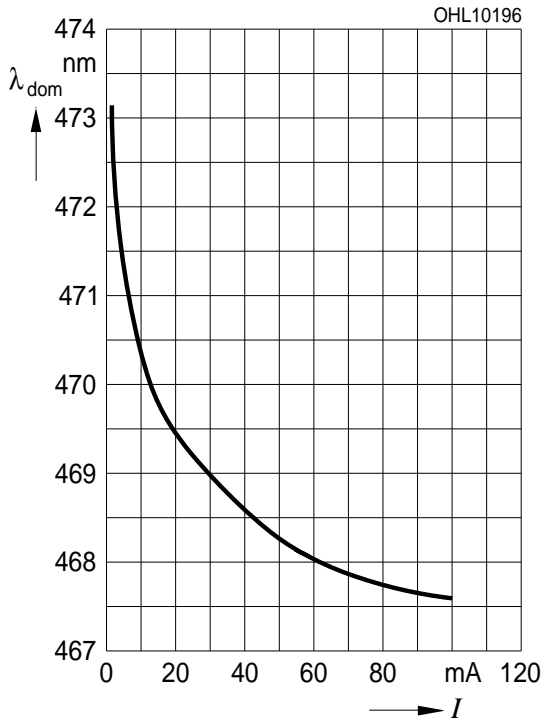
$I_F = 30\text{ mA}$



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

Dominant Wavelength

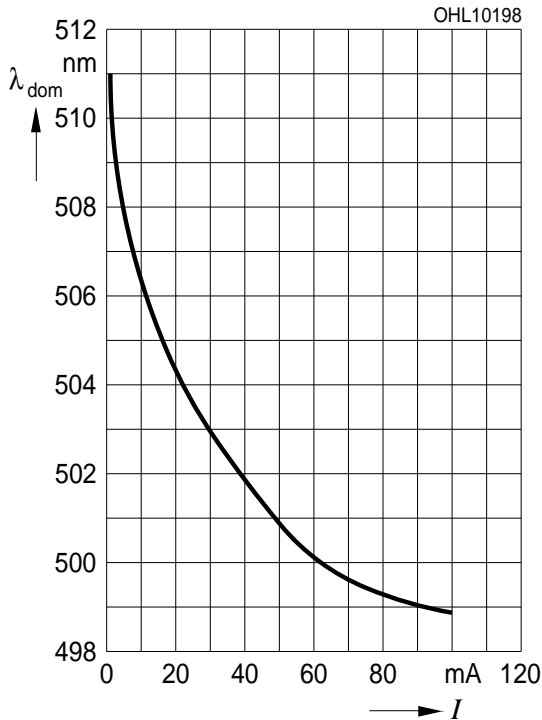
LB, $T_A = 25\text{ °C}$



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

Dominant Wavelength

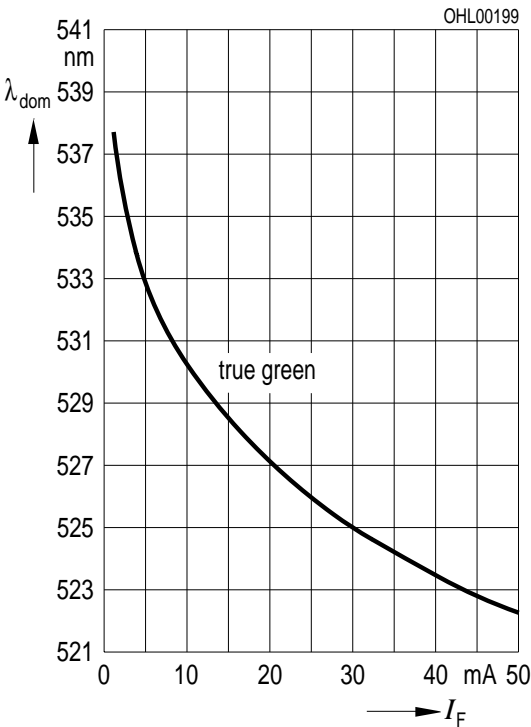
LV, $T_A = 25\text{ °C}$



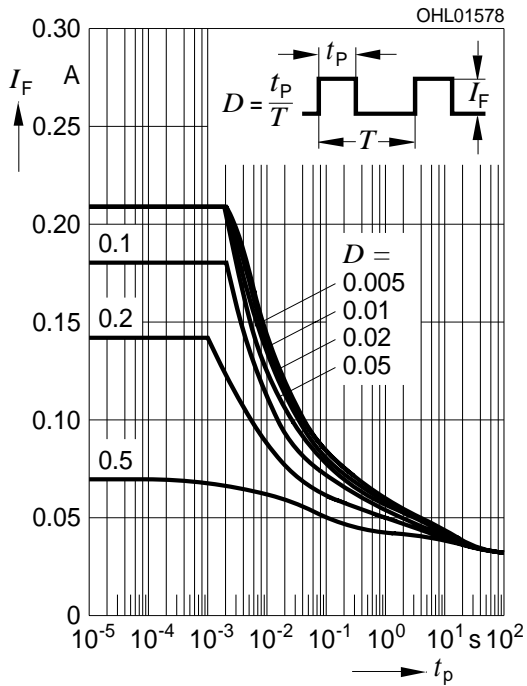
Dominante Wellenlänge $\lambda_{\text{dom}} = f(I_F)$

Dominant Wavelength

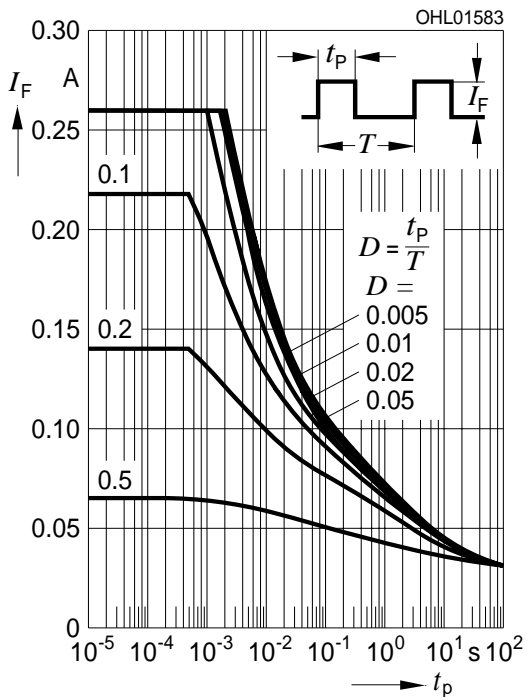
LT, $T_A = 25\text{ °C}$



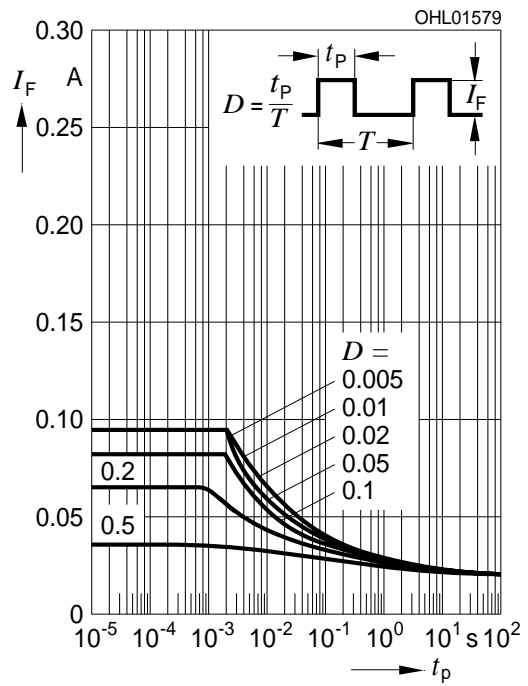
Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability
 Duty cycle $D = \text{parameter}$, $T_A = 25^\circ\text{C}$
LB



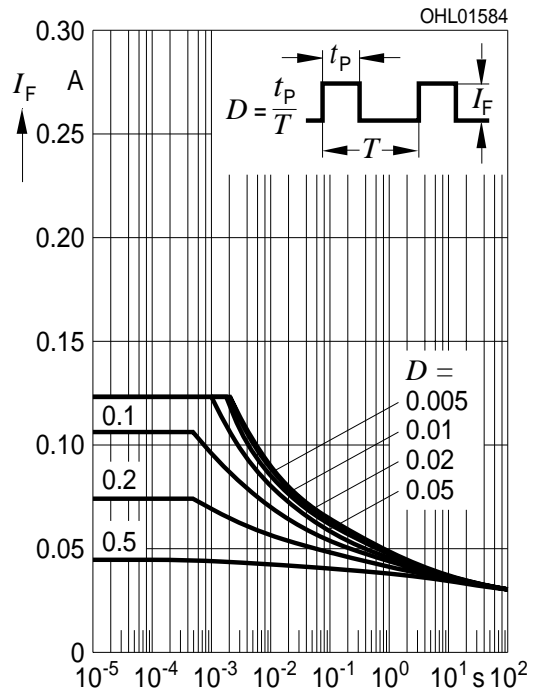
Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability
 Duty cycle $D = \text{parameter}$, $T_A = 25^\circ\text{C}$
LT / LV



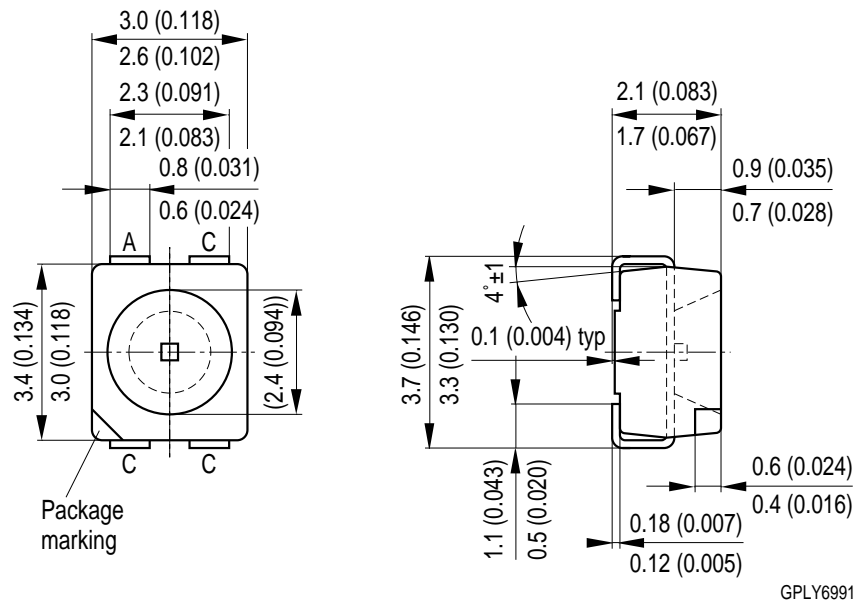
Zulässige Impulsbelastbarkeit $I_F = f(t_p)$
Permissible Pulse Handling Capability
 Duty cycle $D = \text{parameter}$, $T_A = 85^\circ\text{C}$
LB



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



Maßzeichnung Package Outlines

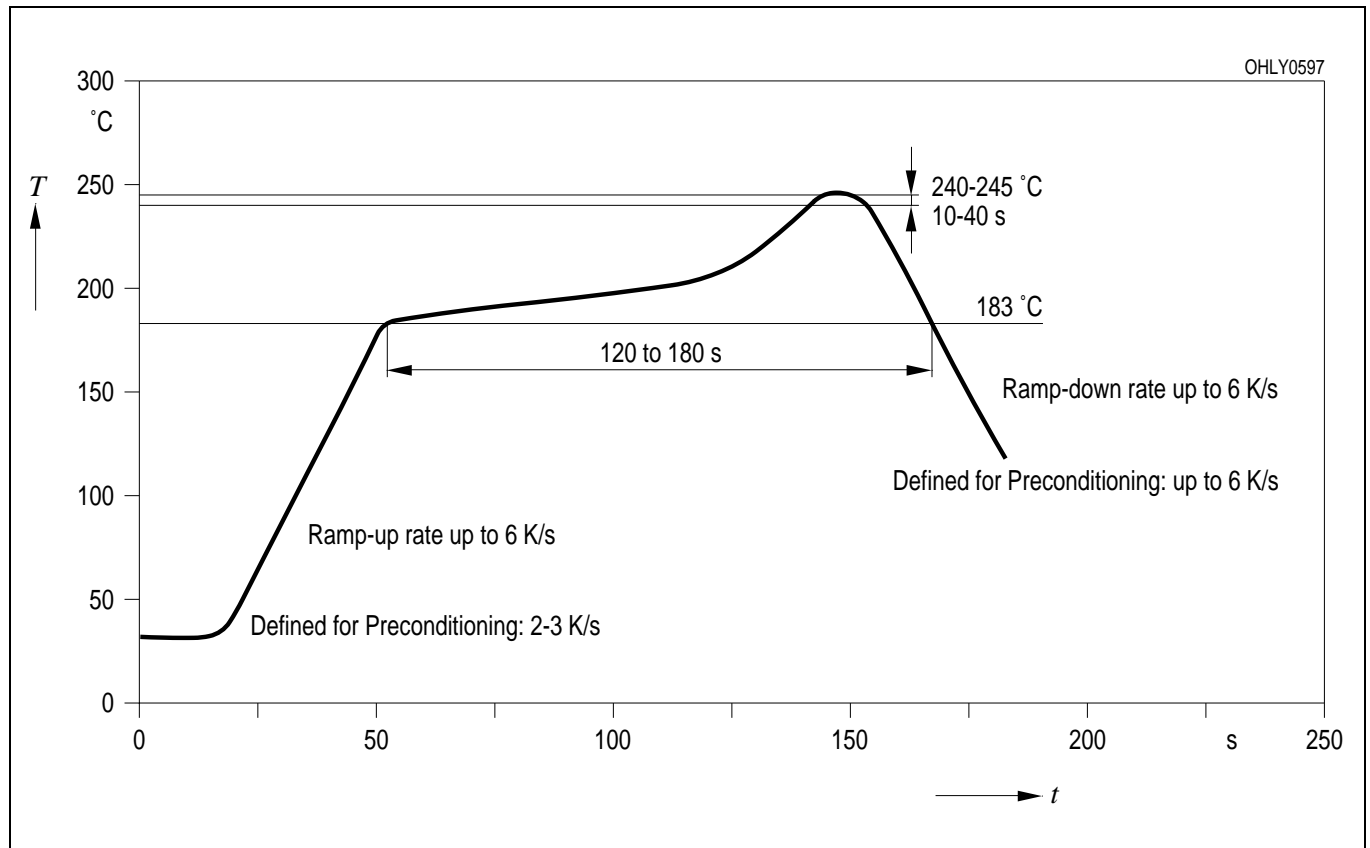


Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

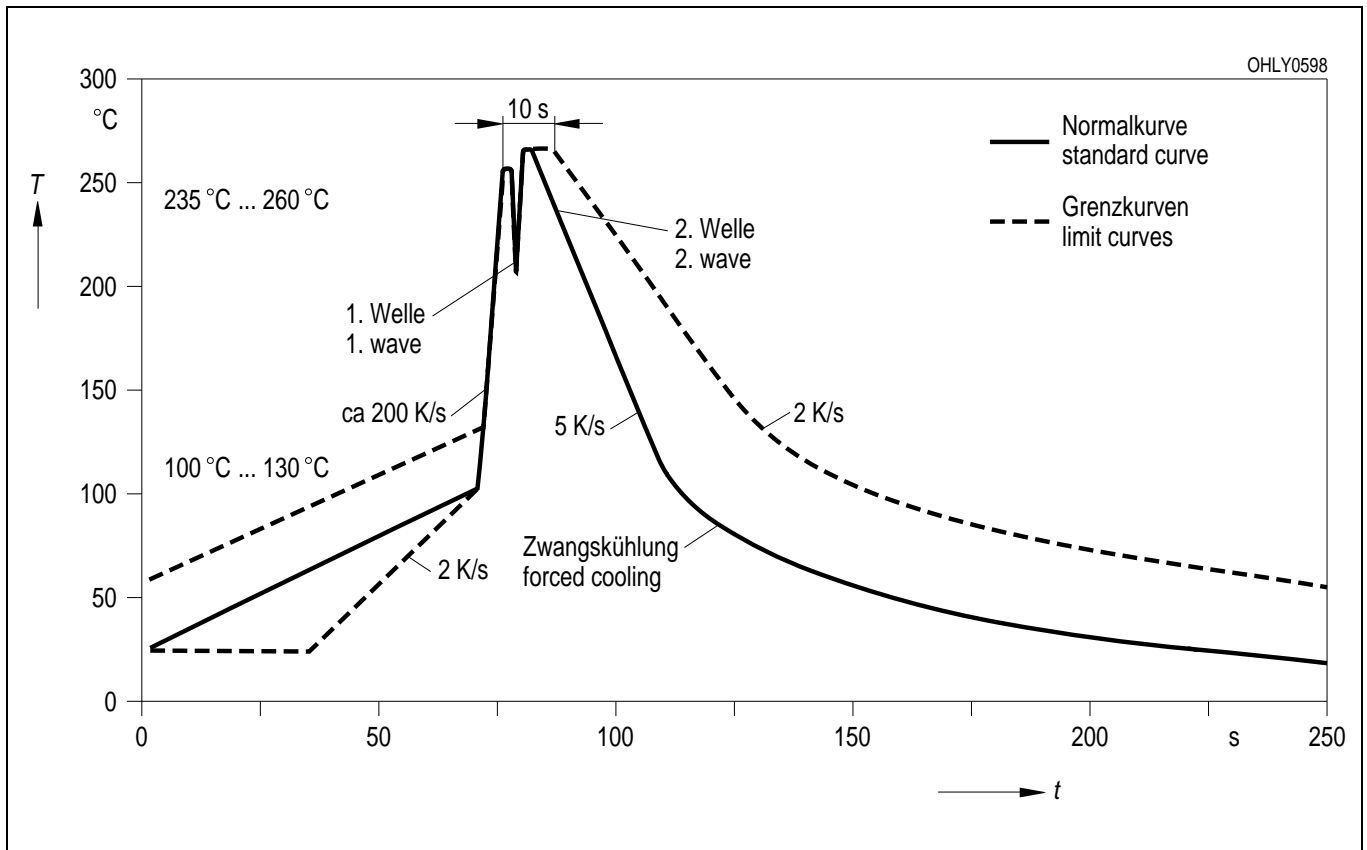
Gewicht / Approx. weight: 31 mg

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

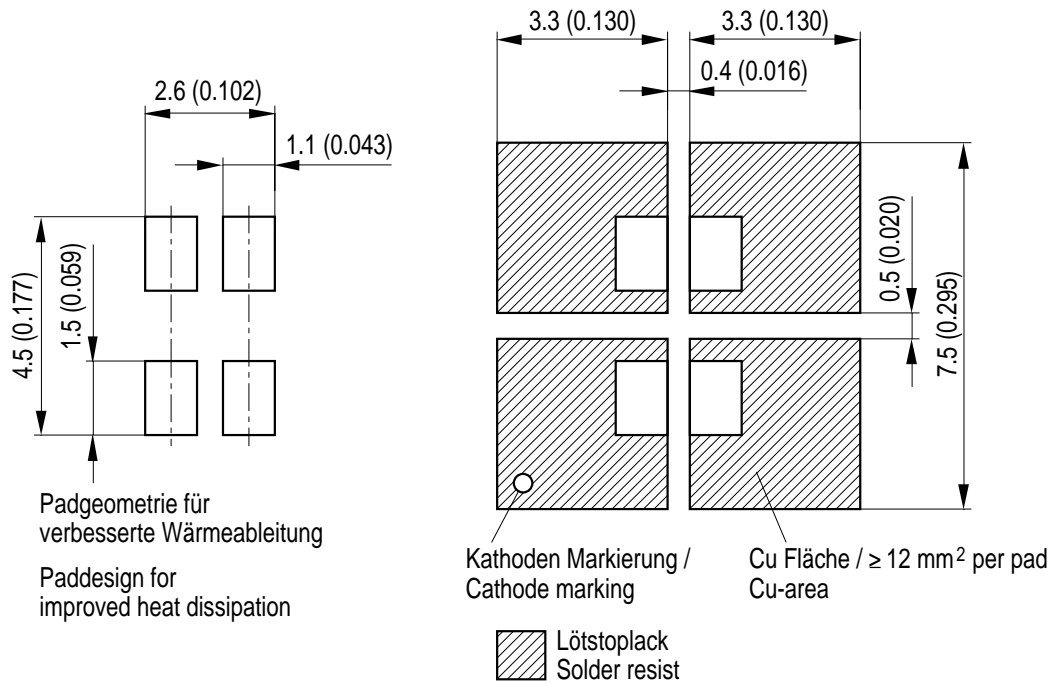
IR-Reflow Lötprofil (nach IPC 9501)
IR Reflow Soldering Profile (acc. to IPC 9501)



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



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



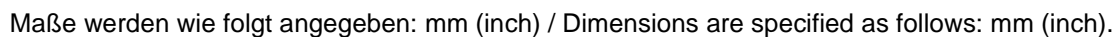
OHLPY439

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



Verpackungseinheit 2000/Rolle, ø180 mm
oder 8000/Rolle, ø330 mm

Packing unit 2000/reel, $\varnothing 180$ mm
or 8000/reel, $\varnothing 330$ mm



| Revision History: 2002-07-17 | | Date of change |
|------------------------------|--|----------------|
| Previous Version: 2002-07-02 | | |
| Page | Subjects (major changes since last revision) | |
| 4 | value (forward voltage) | |
| 7 | diagram OHL01569/01570 to OHL01488/11489 | |
| 8 | diagram OHL01620/01627/01621 to OHL10196/10198/00199 | |
| 2 | wavelength grouping for blue, true green and verde | |
| 2 | brightness grouping for LV E63C | 2002-07-17 |

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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.

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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.