

# Hyper TOPLED

## White Hyper-Bright LED

LW T67C



### Vorläufige Daten / Preliminary Data

#### Besondere Merkmale

- **Gehäusotyp:** weißes P-LCC-2 Gehäuse
- **Besonderheit des Bauteils:** extrem breite Abstrahlcharakteristik; ideal für Hinterleuchtungen und Einkopplungen in Lichtleiter
- **Farbort:**  $x = 0,32$ ,  $y = 0,31$  nach CIE 1931 (weiß)
- **typische Farbtemperatur:** 6500 K
- **Farbwiedergabeindex:** 80
- **Abstrahlwinkel:** Lambertscher Strahler ( $120^\circ$ )
- **Technologie:** InGaN
- **optischer Wirkungsgrad:** 12 lm/W
- **Gruppierungsparameter:** Lichtstärke, Farbort
- **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,  $\varnothing 180$  mm oder 8000/Rolle,  $\varnothing 330$  mm
- **ESD-Festigkeit:** ESD-sicher bis 2 kV nach EOS/ESD-5.1-1993

#### Anwendungen

- Informationsanzeigen im Außenbereich
- Hinterleuchtung (LCD, Schalter, Tasten, Displays, Werbebeleuchtung)
- Innen- und Außenbeleuchtung im Automobilbereich
- Ersatz von Kleinst-Glühlampen, Leselampen
- Rettungsnotleuchten
- Signal- und Symbolleuchten
- Markierungsbeleuchtung (z.B. Stufen, Fluchtwege, u.ä.)

#### Features

- **package:** white P-LCC-2 package
- **feature of the device:** extremely wide viewing angle; ideal for backlighting and coupling in light guides
- **color coordinates:**  $x = 0.32$ ,  $y = 0.31$  acc. to CIE 1931 (white)
- **typ. color temperature:** 6500 K
- **color reproduction index:** 80
- **viewing angle:** Lambertian Emitter ( $120^\circ$ )
- **technology:** InGaN
- **optical efficiency:** 12 lm/W
- **grouping parameter:** luminous intensity, color coordinates
- **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,  $\varnothing 180$  mm or 8000/reel,  $\varnothing 330$  mm
- **ESD-withstand voltage:** up to 2 kV acc. to EOS/ESD-5.1-1993

#### Applications

- outdoor displays
- backlighting (LCD, switches, keys, displays, illuminated advertising)
- interior and exterior automotive lighting
- substitution of micro incandescent lamps, reading lamps
- emergency lighting
- signal and symbol luminaire
- marker lights (e.g. steps, exit ways, etc.)

| Typ            | Emissions-<br>farbe  | Farbe der<br>Lichtaustritts-<br>fläche | Lichtstärke                                                           | Lichtstrom                                                         | Bestellnummer |
|----------------|----------------------|----------------------------------------|-----------------------------------------------------------------------|--------------------------------------------------------------------|---------------|
| Type           | Color of<br>Emission | Color of the<br>Light Emitting<br>Area | Luminous<br>Intensity<br>$I_F = 20 \text{ mA}$<br>$I_V \text{ (mcd)}$ | Luminous<br>Flux<br>$I_F = 20 \text{ mA}$<br>$\Phi_V \text{ (lm)}$ | Ordering Code |
| LW T67C-R2S2-1 | white                | colored                                | 140 ... 280                                                           | 630 (typ.)                                                         | Q62703-Q6217  |
| LW T67C-S2U1-1 |                      | diffused                               | 224 ... 560                                                           | 1200 (typ.)                                                        | Q62703-Q6218  |

Anm.: -1 Farbselektiert nach Farbortgruppen

*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 Color selection acc. to Chromaticity coordinate groups

*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<br>Parameter                                                                                                                                                    | Symbol<br>Symbol | Wert<br>Value  | Einheit<br>Unit |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|----------------|-----------------|
| Betriebstemperatur<br>Operating temperature range                                                                                                                           | $T_{op}$         | - 40 ... + 100 | °C              |
| Lagertemperatur<br>Storage temperature range                                                                                                                                | $T_{stg}$        | - 40 ... + 100 | °C              |
| Sperrschichttemperatur<br>Junction temperature                                                                                                                              | $T_j$            | + 110          | °C              |
| Durchlassstrom<br>Forward current                                                                                                                                           | $I_F$            | 20             | mA              |
| Stoßstrom<br>Surge current<br>$t \leq 10 \mu s, D = 0.005$                                                                                                                  | $I_{FM}$         | 0.2            | A               |
| Sperrspannung<br>Reverse voltage                                                                                                                                            | $V_R$            | 5              | V               |
| Leistungsaufnahme<br>Power consumption<br>$T_A \leq 25 \text{ °C}$                                                                                                          | $P_{tot}$        | 90             | mW              |
| Wärmewiderstand<br>Thermal resistance<br>Sperrschicht/Umgebung<br>Junction/ambient                                                                                          | $R_{th JA}$      | 470            | K/W             |
| Sperrschicht/Lötpad<br>Junction/solder point<br>Montage auf PC-Board FR 4 (Padgröße $\geq 16 \text{ mm}^2$ )<br>mounted on PC board FR 4 (pad size $\geq 16 \text{ mm}^2$ ) | $R_{th JS}$      | 230            | K/W             |

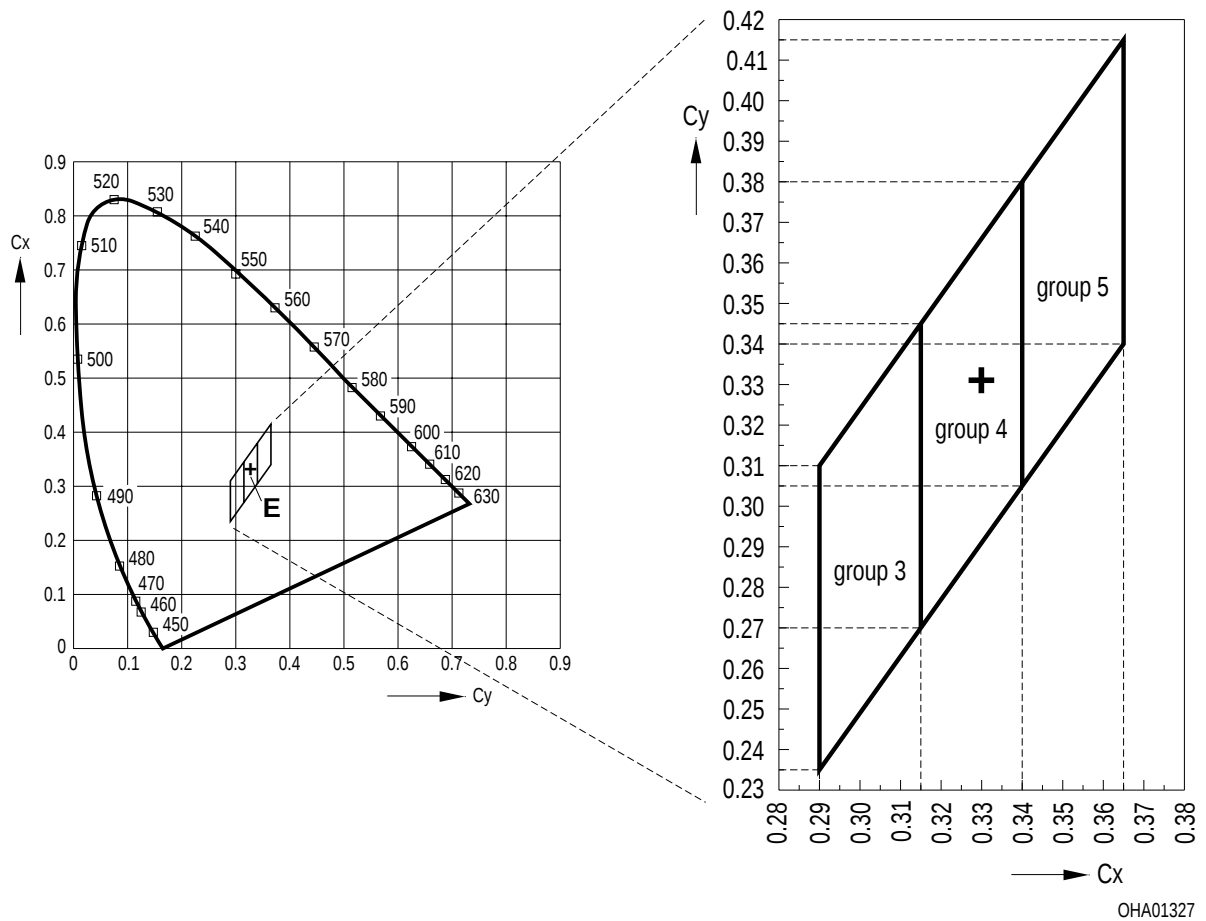
**Kennwerte** ( $T_A = 25\text{ °C}$ )**Characteristics**

| Bezeichnung<br>Parameter                                                                                                                    | Symbol<br>Symbol    | Wert<br>Value | Einheit<br>Unit    |
|---------------------------------------------------------------------------------------------------------------------------------------------|---------------------|---------------|--------------------|
| Farbkoordinate x nach CIE 1931 <sup>1)</sup> (typ.)<br>Chromaticity coordinate x acc. to CIE 1931<br>$I_F = 20\text{ mA}$                   | x                   | 0.32          | –                  |
| Farbkoordinate y nach CIE 1931 <sup>1)</sup> (typ.)<br>Chromaticity coordinate y acc. to CIE 1931<br>$I_F = 20\text{ mA}$                   | y                   | 0.31          | –                  |
| Abstrahlwinkel bei 50 % $I_V$ (Vollwinkel) (typ.)<br>Viewing angle at 50 % $I_V$                                                            | 2φ                  | 120           | Grad<br>deg.       |
| Durchlassspannung <sup>2)</sup> (typ.)<br>Forward voltage (max.)<br>$I_F = 20\text{ mA}$                                                    | $V_F$<br>$V_F$      | 3.8<br>4.3    | V<br>V             |
| Sperrstrom (typ.)<br>Reverse current (max.)<br>$V_R = 5\text{ V}$                                                                           | $I_R$<br>$I_R$      | 0.01<br>10    | μA<br>μA           |
| Temperaturkoeffizient von x (typ.)<br>Temperature coefficient of x<br>$I_F = 20\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$         | $TC_x$              | –0.1          | $10^{-3}/\text{K}$ |
| Temperaturkoeffizient von y (typ.)<br>Temperature coefficient of y<br>$I_F = 20\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$         | $TC_y$              | –0.2          | $10^{-3}/\text{K}$ |
| Temperaturkoeffizient von $V_F$ (typ.)<br>Temperature coefficient of $V_F$<br>$I_F = 20\text{ mA}; -10\text{ °C} \leq T \leq 100\text{ °C}$ | $TC_V$              | – 3.0         | mV/K               |
| Optischer Wirkungsgrad (typ.)<br>Optical efficiency<br>$I_F = 20\text{ mA}$                                                                 | $\eta_{\text{opt}}$ | 12            | lm/W               |

<sup>1)</sup> Farbortgruppen werden mit einer Stromeinprägungsdauer von 25 ms und einer Genauigkeit von  $\pm 0,01$  ermittelt.  
Chromaticity coordinate groups are tested at a current pulse duration of 25 ms and a tolerance of  $\pm 0.01$ .

<sup>2)</sup> Spannungswerte werden mit einer Stromeinprägungsdauer 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) **Farbortgruppen**  
**Chromaticity coordinate groups**



### Helligkeits-Gruppierungsschema Luminous Intensity Groups

| Lichtgruppe<br>Luminous Intensity Group | Lichtstärke<br>Luminous Intensity<br>$I_v$ (mcd) | Lichtstrom<br>Luminous Flux<br>$\Phi_v$ (lm) |
|-----------------------------------------|--------------------------------------------------|----------------------------------------------|
| 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.)                                  |

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: S2-4

Example: S2-4

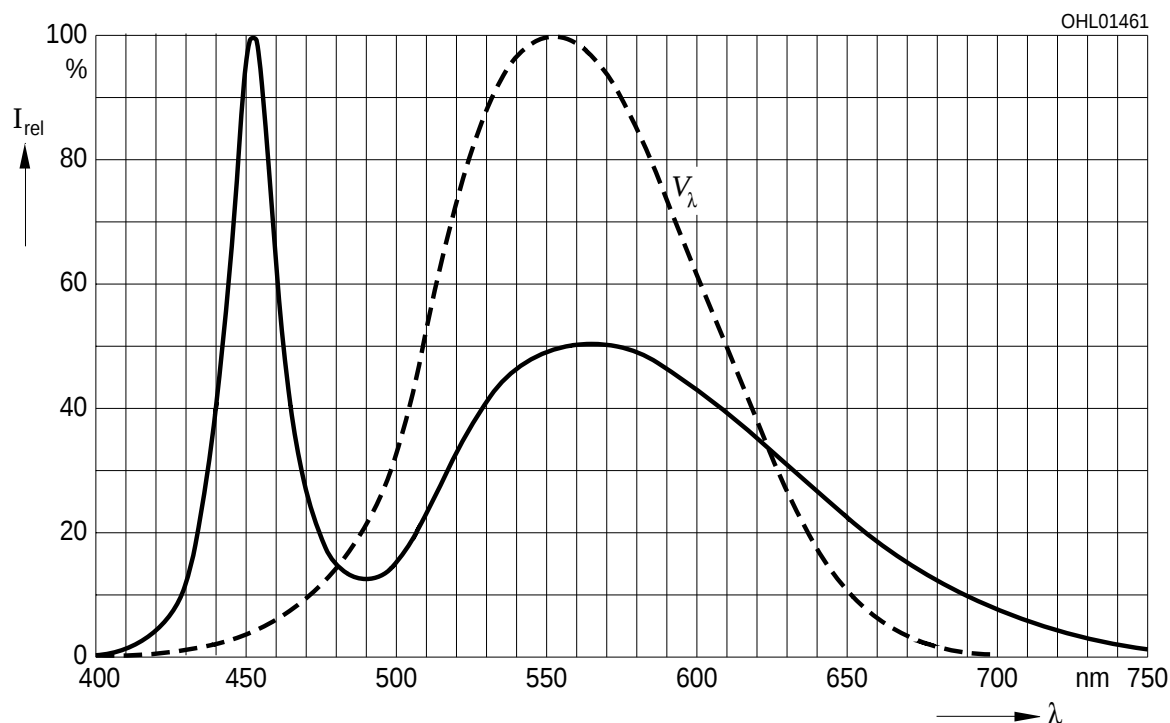
| Lichtgruppe<br>Luminous Intensity Group | Halbgruppe<br>Half Group | Farbortgruppe<br>Chromaticity Coordinate Group |
|-----------------------------------------|--------------------------|------------------------------------------------|
| S                                       | 2                        | 4                                              |

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

### Relative Spectral Emission

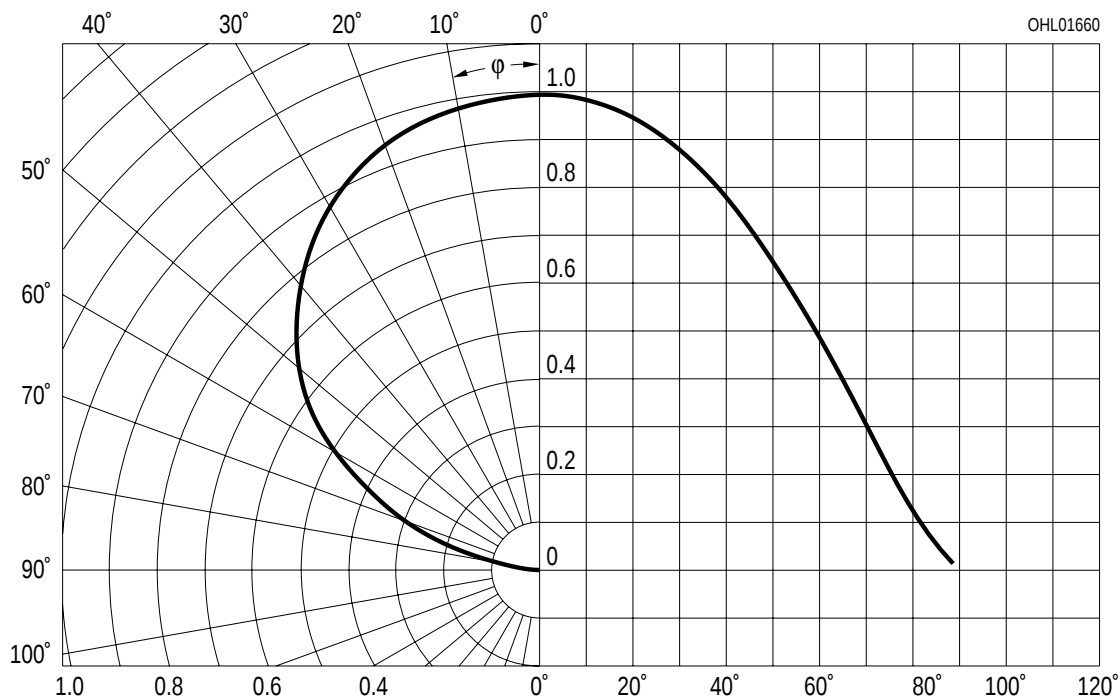
$V(\lambda)$  = spektrale Augenempfindlichkeit

Standard eye response curve



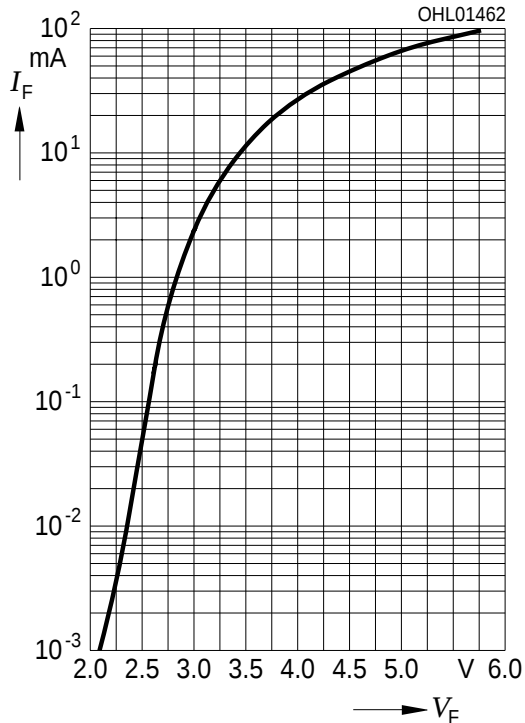
**Abstrahlcharakteristik**  $I_{\text{rel}} = f(\varphi)$

### Radiation Characteristic

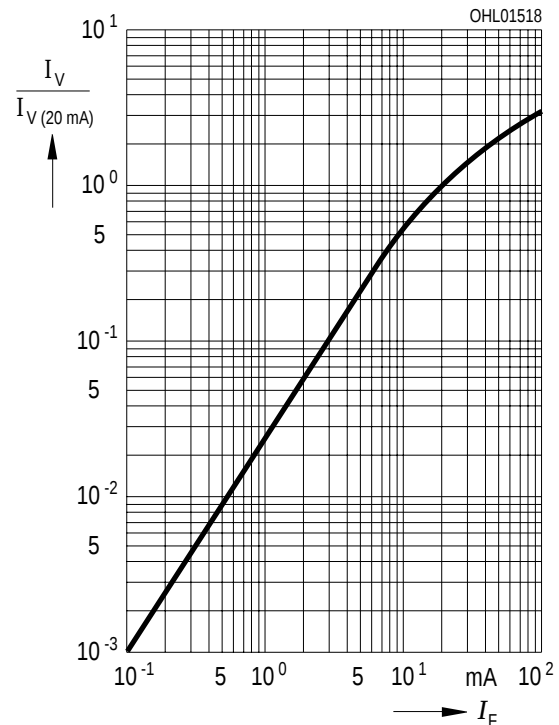


Durchlassstrom  $I_F = f(V_F)$ 

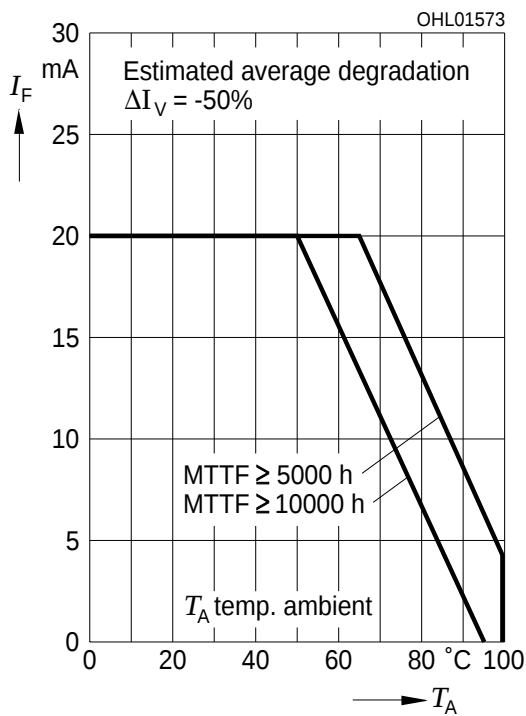
Forward Current

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

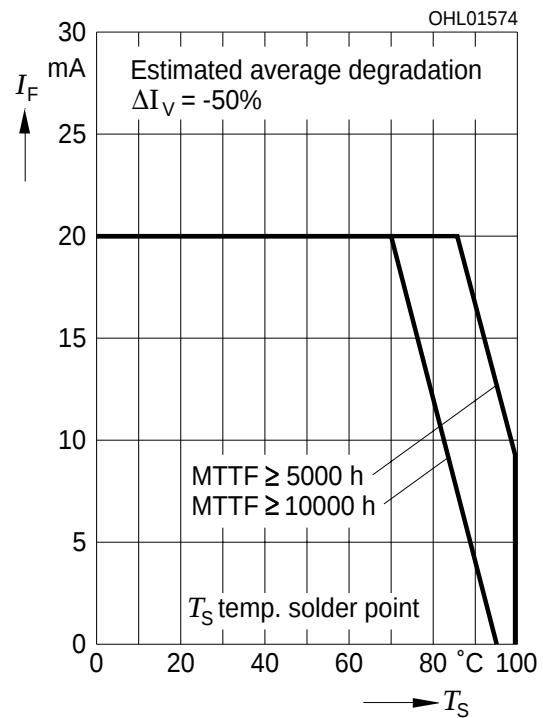
Relative Luminous Intensity

 $T_A = 25\text{ °C}$ Maximal zulässiger Durchlassstrom  $I_F = f(T)$ 

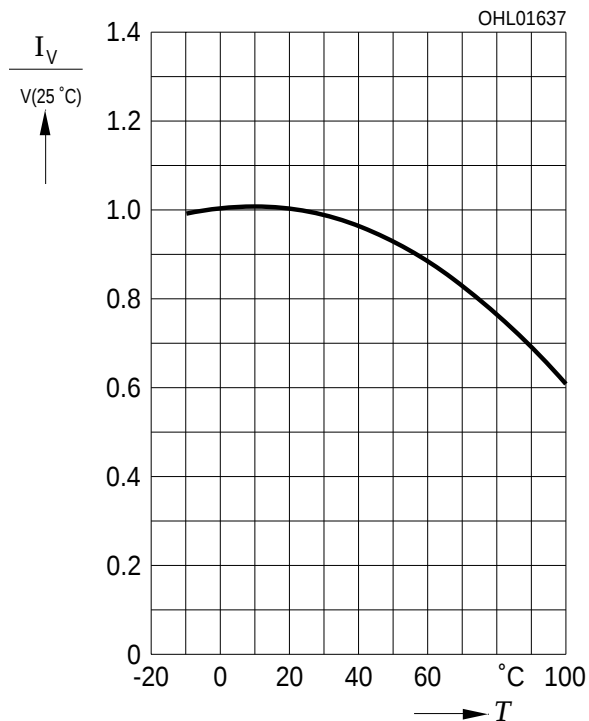
Max. Permissible Forward Current

Maximal zulässiger Durchlassstrom  $I_F = f(T)$ 

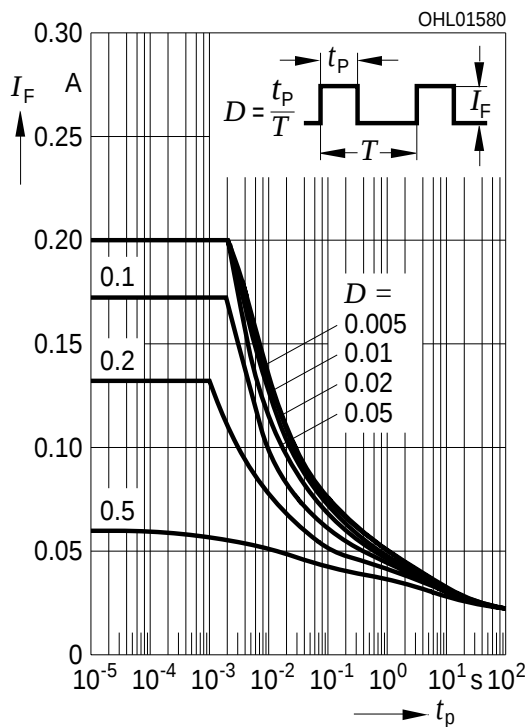
Max. Permissible Forward Current



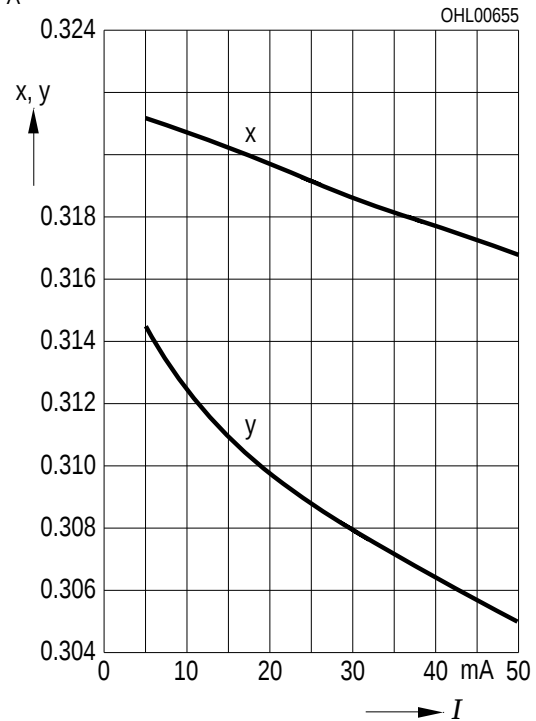
**Relative Lichtstärke  $I_V/I_{V(25^\circ\text{C})} = f(T_A)$**   
**Relative Luminous Intensity**  
 $I_F = 20 \text{ mA}$



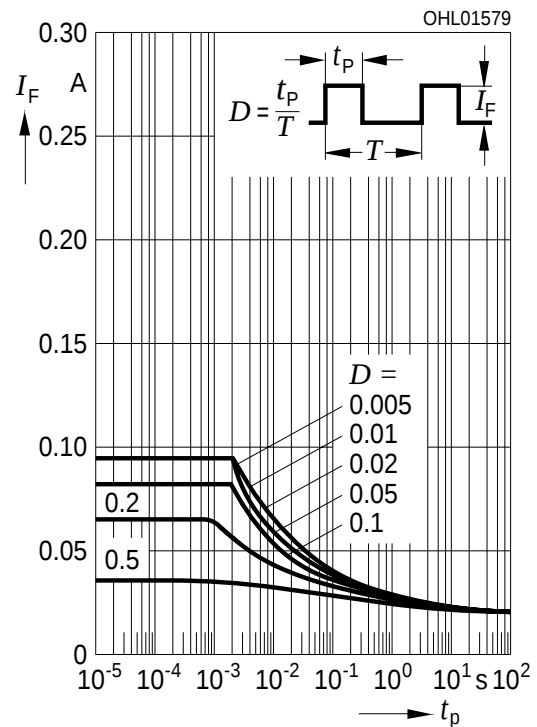
**Zulässige Impulsbelastbarkeit  $I_F = f(t_p)$**   
**Permissible Pulse Handling Capability**  
Duty cycle  $D = \text{parameter}$ ,  $T_A = 25^\circ\text{C}$



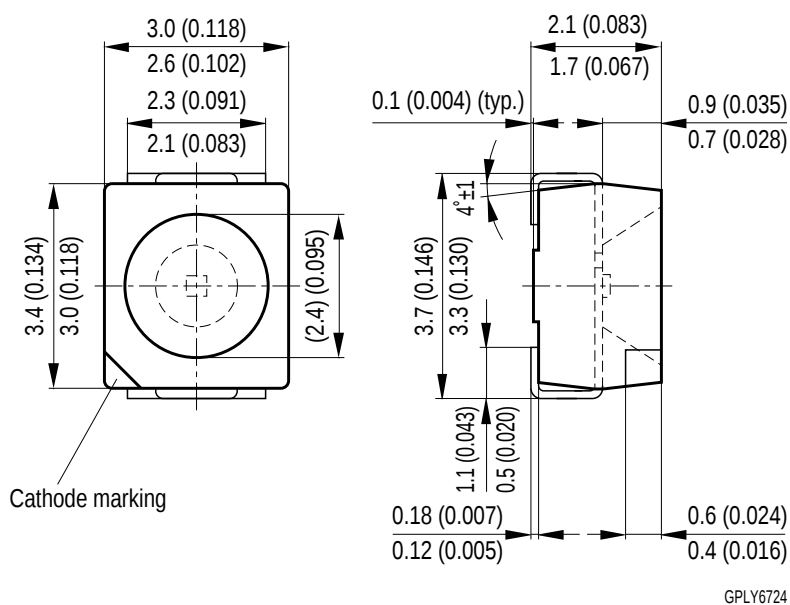
**Farbortverschiebung  $x, y = f(I_F)$**   
**Chromaticity Coordinate Shift**  
 $T_A = 25^\circ\text{C}$



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



## Maßzeichnung Package Outlines

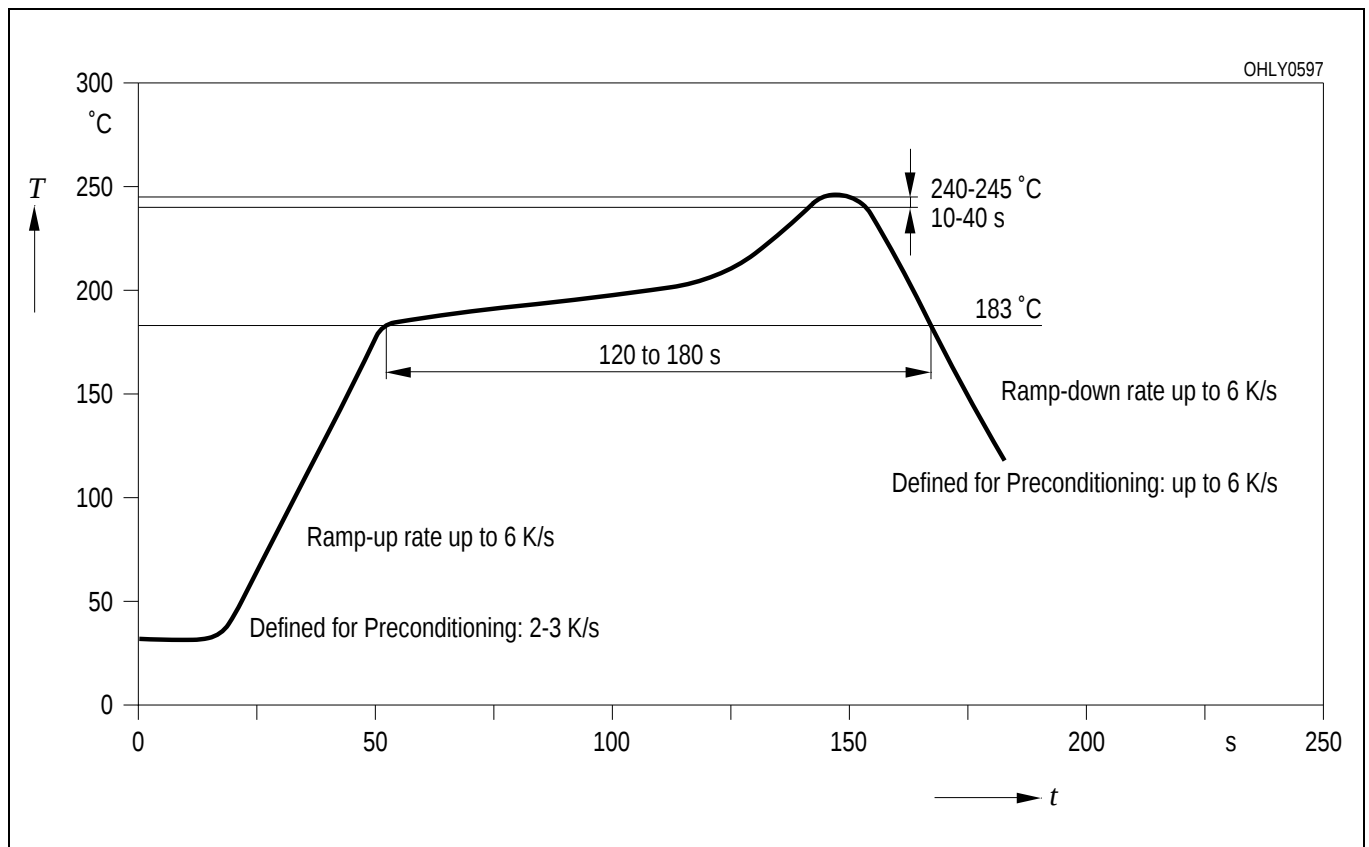


Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

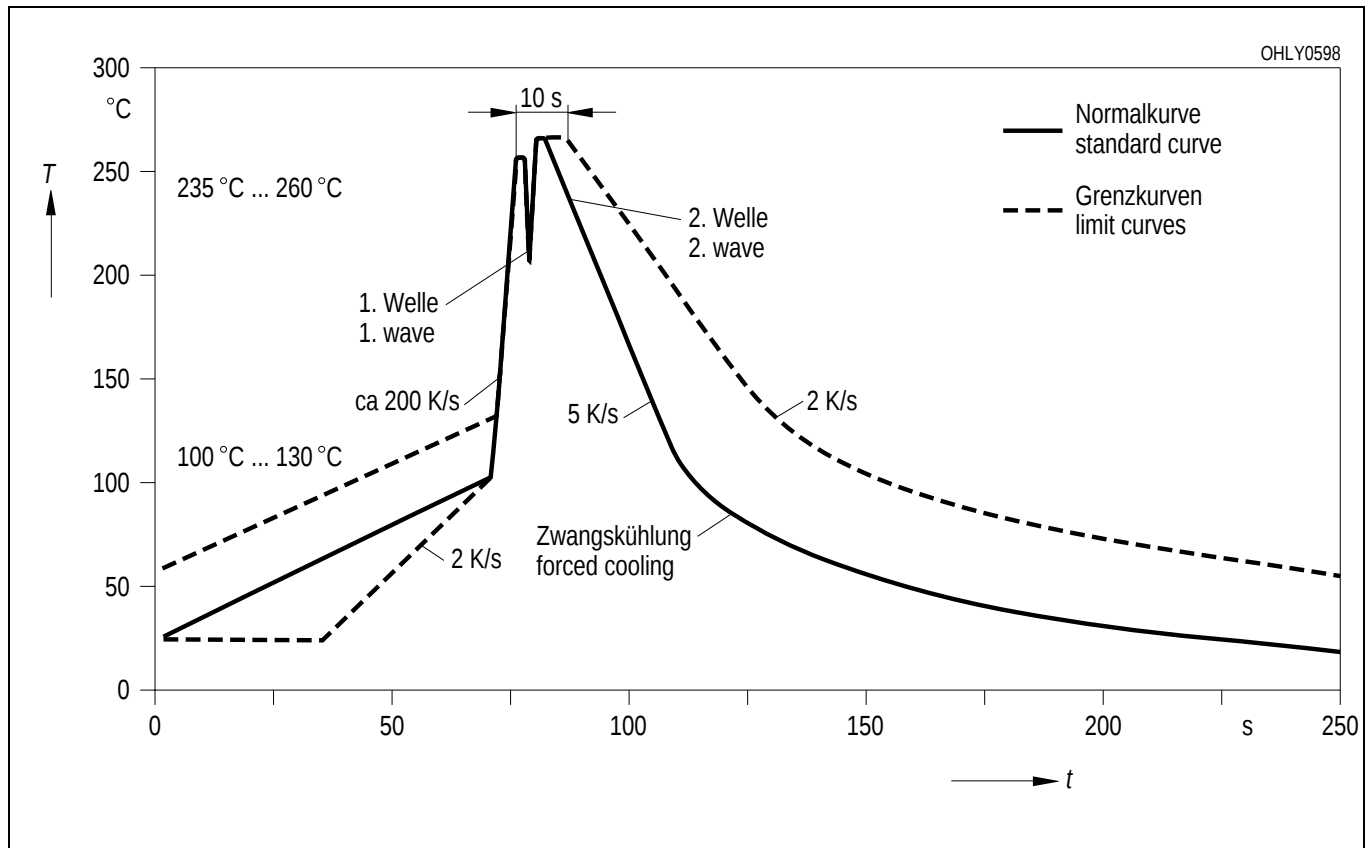
**Kathodenkennung:** abgeschrägte Ecke  
**Cathode mark:** bevelled edge  
**Gewicht / Approx. weight:** 40 mg

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

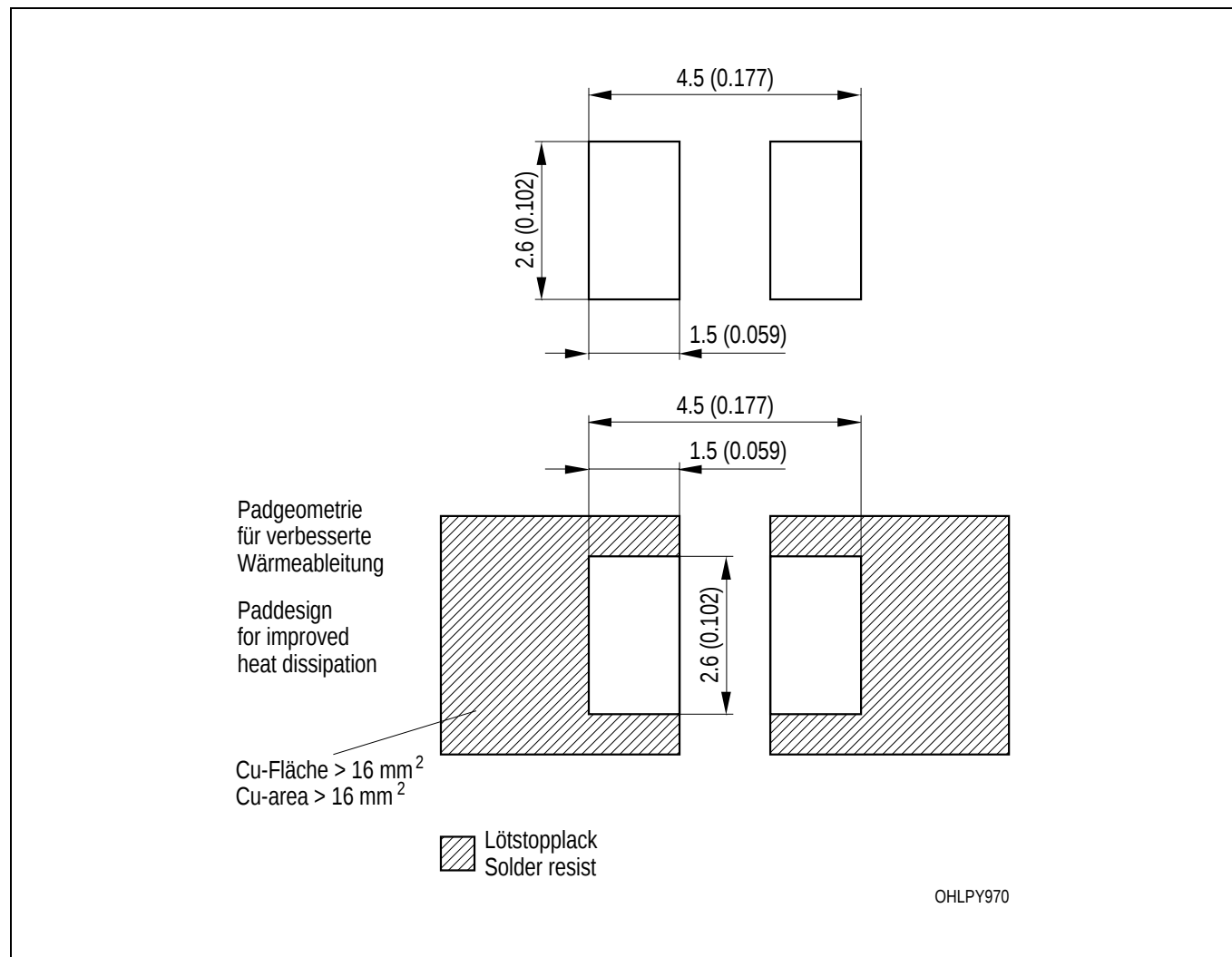
**IR-Reflow Lötprofil** (nach IPC 9501)  
**IR Reflow Soldering Profile** (acc. to IPC 9501)



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



**Empfohlenes Lötpaddesign** IR Reflow Löten / Wellenlöten (TTW)  
**Recommended Solder Pad** IR Reflow Soldering / TTW Soldering



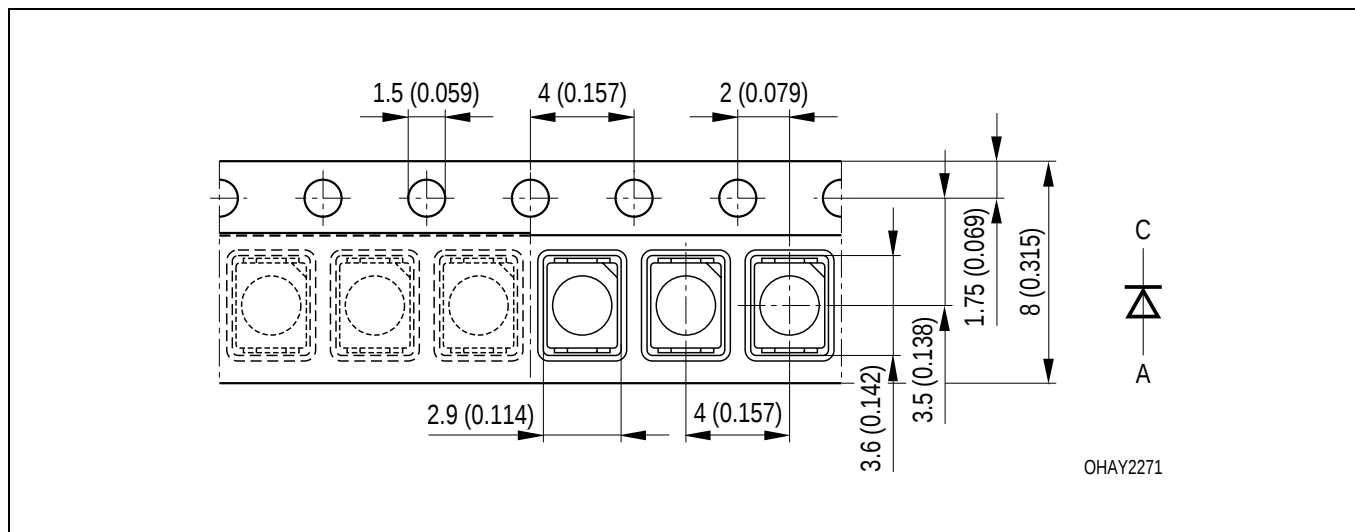
Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

**Gurtung / Polarität und Lage**

Verpackungseinheit 2000/Rolle,  $\varnothing 180$  mm  
oder 8000/Rolle,  $\varnothing 330$  mm

**Method of Taping / Polarity and Orientation**

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



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

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**Revision History: 2001-10-02**

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Previous Version: 2001-02-06

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| Page | Subjects (major changes since last revision) |
|------|----------------------------------------------|
| 7    | Relative Spectral Emission $I_{rel}$         |
| 4    | value (forward voltage)                      |

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**Patent List**

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**Patent No.**

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US 6 066 861, US 6 277 301

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**Published by OSRAM Opto Semiconductors GmbH & Co. OHG**

**Wernerwerkstrasse 2, D-93049 Regensburg**

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