

OSRAM LTRBR37G

Datasheet

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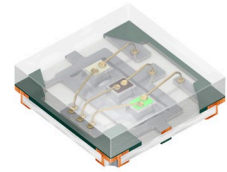
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Multi Chip LED

LTRB R37G

This device was designed for low profile consumer applications. The 4-pin common anode technology emits an additive mixture of red, green and blue color by independent driving of each chip. Very compact package size and low z-height to support highly integrated consumer applications in displays or accents. Device is white binned.



Applications

- Backlighting (Smartphone, Tablet)
- Electronic Equipment
- Mood Lighting
- White Goods

Features

- Package: SMT package, epoxy resin
- Chip technology: InGaAlP / InGaN on Sapphire
- Typ. Radiation: 120° (Lambertian emitter)
- Color: $\lambda_{\text{dom}} = 530 \text{ nm}$ (● true green); $\lambda_{\text{dom}} = 623 \text{ nm}$ (● red); $\lambda_{\text{dom}} = 472 \text{ nm}$ (● blue)
- ESD: 500 V acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 1B)
- Color: $x = 0.249$, $y = 0.208$. acc. to CIE 1931 (white)
- Luminous Intensity: 159...280 mcd (white), typ. 130 mcd (true green), typ. 45 mcd (red), typ. 25 mcd (blue)

Ordering Information

Type

LTRBR37G-4R4S-0125

Ordering Code

Q65112A6714

Maximum Ratings

| Parameter | Symbol | | Values | Values | Values |
|--|----------------|------|--------------|--------|--------|
| | | | ● true green | ● red | ● blue |
| Operating Temperature | T_{op} | min. | -40 °C | -40 °C | -40 °C |
| | | max. | 85 °C | 85 °C | 85 °C |
| Storage Temperature | T_{stg} | min. | -40 °C | -40 °C | -40 °C |
| | | max. | 85 °C | 85 °C | 85 °C |
| Junction Temperature | T_j | max. | 100 °C | 100 °C | 100 °C |
| Forward Current $T_s = 25\text{ °C}$; 1 chip on | I_F | max. | 25 mA | 25 mA | 10 mA |
| Forward Current $T_s = 25\text{ °C}$; all chips on | I_F | max. | 15 mA | 15 mA | 10 mA |
| Forward Current pulsed $t_p = 1\text{ ms}$; $D = 0.1$; $T_s = 25\text{ °C}$ | $I_{F\ pulse}$ | max. | 100 mA | 60 mA | 20 mA |
| ESD withstand voltage acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 1B) | V_{ESD} | | 500 V | 500 V | 500 V |

Characteristics

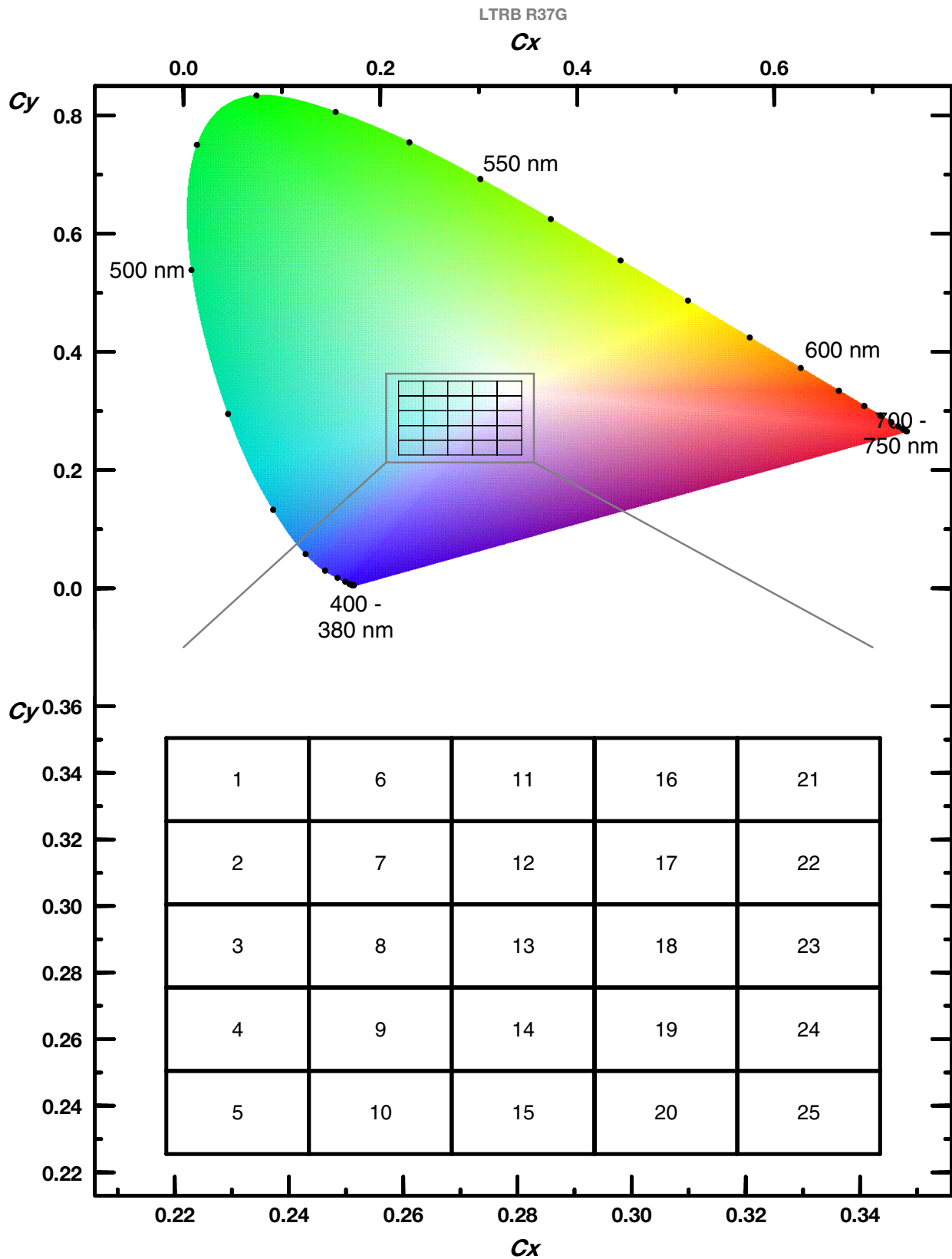
$I_F = 2 \text{ mA}$; $T_S = 25 \text{ °C}$

| Parameter | Symbol | | Values | Values | Values |
|--|-------------------------|------|--------------|------------|-----------|
| | | | ● true green | ● red | ● blue |
| Peak Wavelength | λ_{peak} | typ. | 518 nm | 630 nm | 466 nm |
| Dominant Wavelength ¹⁾ | λ_{dom} | typ. | 530 nm | 623 nm | 472 nm |
| Spectral bandwidth at 50% $I_{\text{rel,max}}$ | $\Delta\lambda$ | typ. | 33 nm | 16 nm | 25 nm |
| Viewing angle at 50% I_V | 2ϕ | typ. | 120 ° | 120 ° | 120 ° |
| Forward Voltage ²⁾ $I_F = 2 \text{ mA}$ | V_F | min. | 2.4 V | 1.3 V | 2.4 V |
| | | typ. | 2.7 V | 1.9 V | 2.8 V |
| | | max. | 3.2 V | 2.0 V | 3.2 V |
| Real thermal resistance junction/solderpoint ³⁾ one-chip-operation | $R_{\text{thJS real}}$ | typ. | 630 K / W | 500 K / W | 530 K / W |
| | | max. | 900 K / W | 870 K / W | 780 K / W |
| Real thermal resistance junction/solderpoint ³⁾ multi-chip-operation | $R_{\text{thJS real}}$ | typ. | 740 K / W | 840 K / W | 710 K / W |
| | | max. | 1100 K / W | 1300 K / W | 880 K / W |

Brightness Groups

| Group | Luminous Intensity ⁴⁾ | Luminous Intensity ⁴⁾ |
|-------|---------------------------------------|---------------------------------------|
| | $I_F = 2 \text{ mA}$ min. I_v | $I_F = 2 \text{ mA}$ max. I_v |
| 4R | 159 mcd | 180 mcd |
| 1S | 180 mcd | 201 mcd |
| 2S | 201 mcd | 224 mcd |
| 3S | 224 mcd | 250 mcd |
| 4S | 250 mcd | 280 mcd |

Chromaticity Coordinate Groups



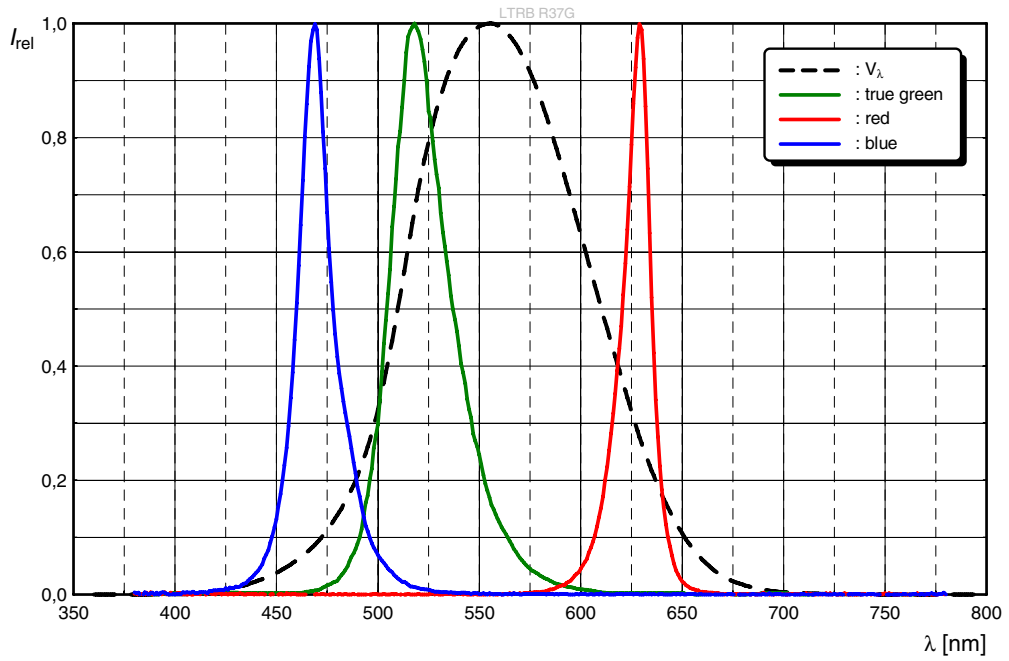
Chromaticity Coordinate Groups

| Group | Cx | Cy | Group | Cx | Cy | Group | Cx | Cy |
|-------|--------|--------|-------|--------|--------|-------|--------|--------|
| 1 | 0.2185 | 0.3505 | 17 | 0.2935 | 0.3255 | 24 | 0.3185 | 0.2755 |
| | 0.2185 | 0.3255 | | 0.2935 | 0.3005 | | 0.3185 | 0.2505 |
| | 0.2435 | 0.3255 | | 0.3185 | 0.3005 | | 0.3435 | 0.2505 |
| | 0.2435 | 0.3505 | | 0.3185 | 0.3255 | | 0.3435 | 0.2755 |
| 10 | 0.2435 | 0.2505 | 18 | 0.2935 | 0.3005 | 25 | 0.3185 | 0.2505 |
| | 0.2435 | 0.2255 | | 0.2935 | 0.2755 | | 0.3185 | 0.2255 |
| | 0.0685 | 0.2255 | | 0.3185 | 0.2755 | | 0.3435 | 0.2255 |
| | 0.2685 | 0.2505 | | 0.3185 | 0.3005 | | 0.3435 | 0.2505 |
| 11 | 0.2685 | 0.3505 | 19 | 0.2935 | 0.2755 | 3 | 0.2185 | 0.3505 |
| | 0.2685 | 0.3255 | | 0.2935 | 0.2505 | | 0.2185 | 0.2755 |
| | 0.2935 | 0.3255 | | 0.3185 | 0.2505 | | 0.2435 | 0.2755 |
| | 0.2935 | 0.3505 | | 0.3185 | 0.2755 | | 0.2435 | 0.3505 |
| 12 | 0.2685 | 0.3255 | 2 | 0.2185 | 0.3255 | 4 | 0.2185 | 0.2755 |
| | 0.2685 | 0.3005 | | 0.2185 | 0.3505 | | 0.2185 | 0.2505 |
| | 0.2935 | 0.3005 | | 0.2435 | 0.3505 | | 0.2435 | 0.2505 |
| | 0.2935 | 0.3255 | | 0.2435 | 0.3255 | | 0.2435 | 0.2755 |
| 13 | 0.2685 | 0.3005 | 20 | 0.2935 | 0.2505 | 5 | 0.2185 | 0.2505 |
| | 0.2685 | 0.2755 | | 0.2935 | 0.2255 | | 0.2185 | 0.2255 |
| | 0.2935 | 0.2755 | | 0.3185 | 0.2255 | | 0.2435 | 0.2255 |
| | 0.2935 | 0.3005 | | 0.3185 | 0.2505 | | 0.2435 | 0.2505 |
| 14 | 0.2685 | 0.2755 | 21 | 0.3185 | 0.3505 | 6 | 0.2435 | 0.3505 |
| | 0.2685 | 0.2505 | | 0.3185 | 0.3255 | | 0.2435 | 0.3255 |
| | 0.2935 | 0.2505 | | 0.3435 | 0.3255 | | 0.0685 | 0.3255 |
| | 0.2935 | 0.2755 | | 0.3435 | 0.3505 | | 0.2685 | 0.3505 |
| 15 | 0.2685 | 0.2505 | 22 | 0.3185 | 0.3255 | 7 | 0.2435 | 0.3255 |
| | 0.2685 | 0.2255 | | 0.3185 | 0.3005 | | 0.2435 | 0.3005 |
| | 0.2935 | 0.2255 | | 0.3435 | 0.3005 | | 0.0685 | 0.3005 |
| | 0.2935 | 0.2505 | | 0.3435 | 0.3255 | | 0.2685 | 0.3255 |
| 16 | 0.2935 | 0.3505 | 23 | 0.3185 | 0.3005 | 8 | 0.2435 | 0.3005 |
| | 0.2935 | 0.3255 | | 0.3185 | 0.2755 | | 0.2435 | 0.2755 |
| | 0.3185 | 0.3255 | | 0.3435 | 0.2755 | | 0.0685 | 0.2755 |
| | 0.3185 | 0.3505 | | 0.3435 | 0.3005 | | 0.2685 | 0.3005 |

| Group | Cx | Cy |
|-------|--------|--------|
| 9 | 0.2435 | 0.2755 |
| | 0.2435 | 0.2505 |
| | 0.0685 | 0.2505 |
| | 0.2685 | 0.2755 |

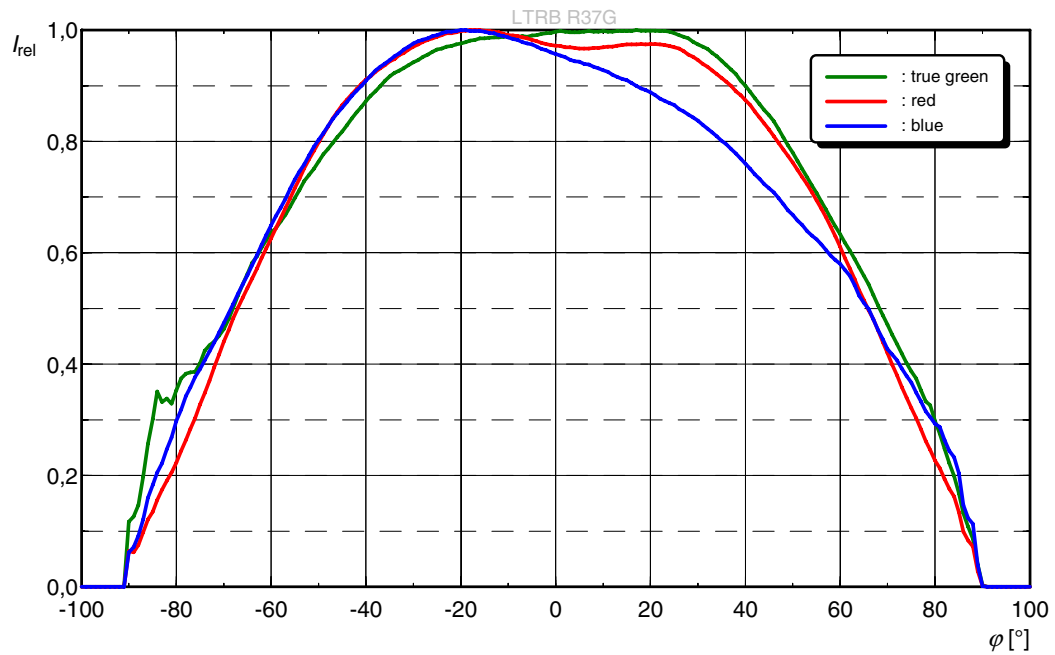
Relative Spectral Emission ⁵⁾

$I_{rel} = f(\lambda); I_F = 2 \text{ mA}; T_S = 25 \text{ }^\circ\text{C}$



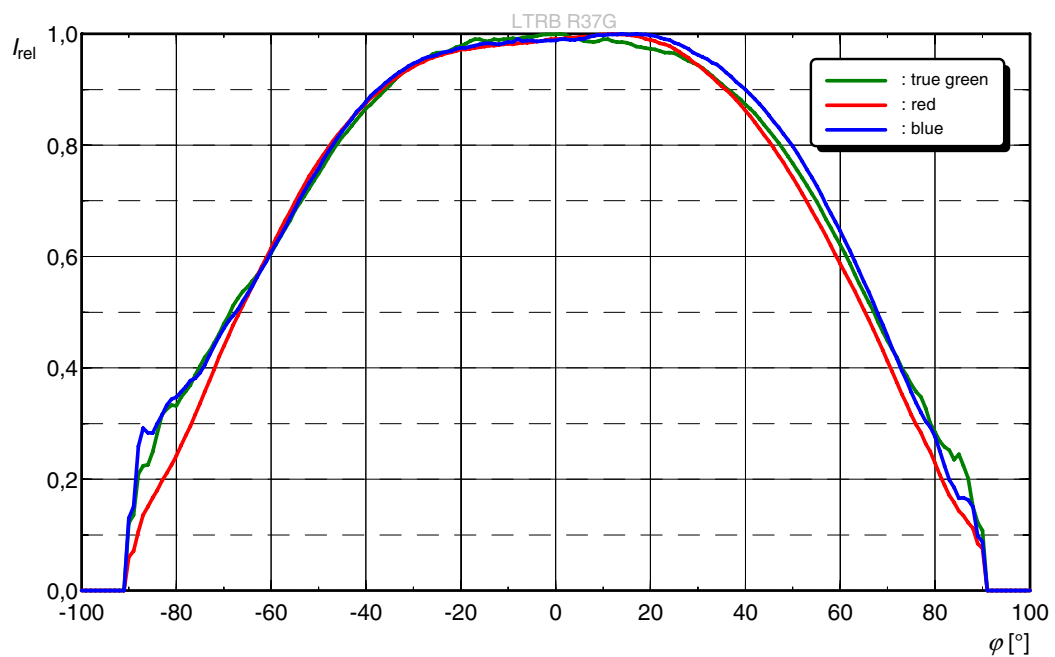
Radiation Characteristic (horizontal) ⁵⁾

$I_{rel} = f(\phi)$; $T_S = 25\text{ °C}$, $I_F = 2\text{ mA}$



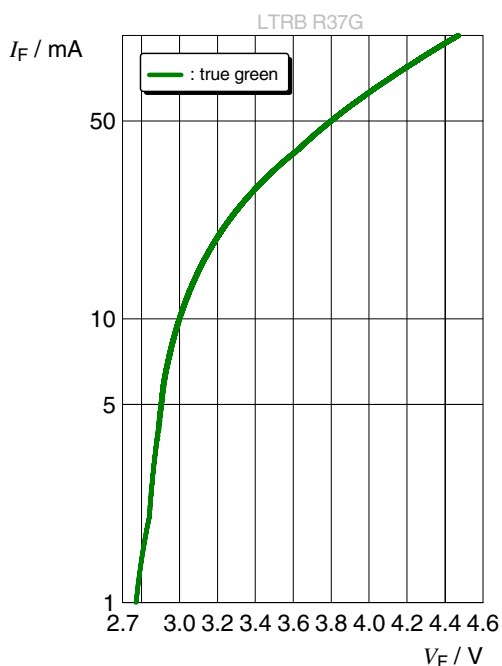
Radiation Characteristic (vertical) ⁵⁾

$I_{rel} = f(\phi)$; $T_S = 25\text{ °C}$, $I_F = 2\text{ mA}$



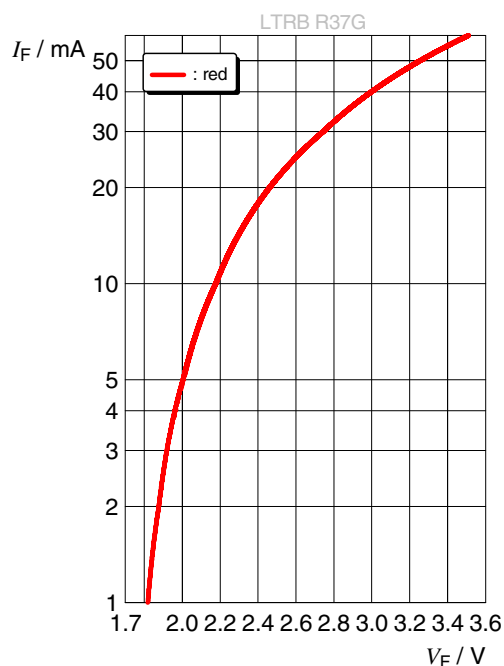
Forward current ⁵⁾

$I_F = f(V_F); T_S = 25\text{ °C}$



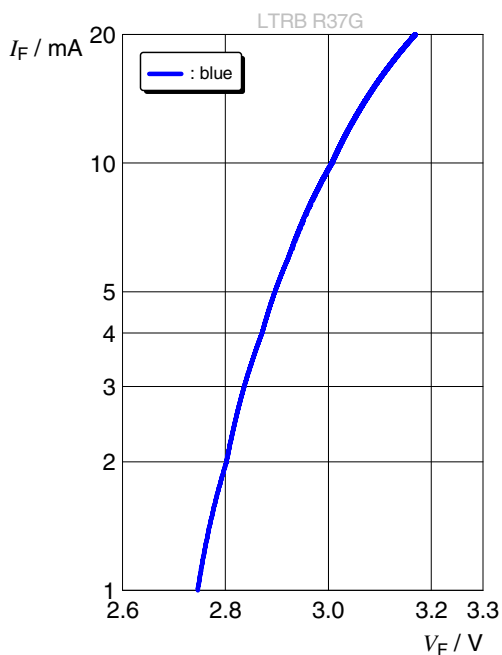
Forward current ⁵⁾

$I_F = f(V_F); T_S = 25\text{ °C}$



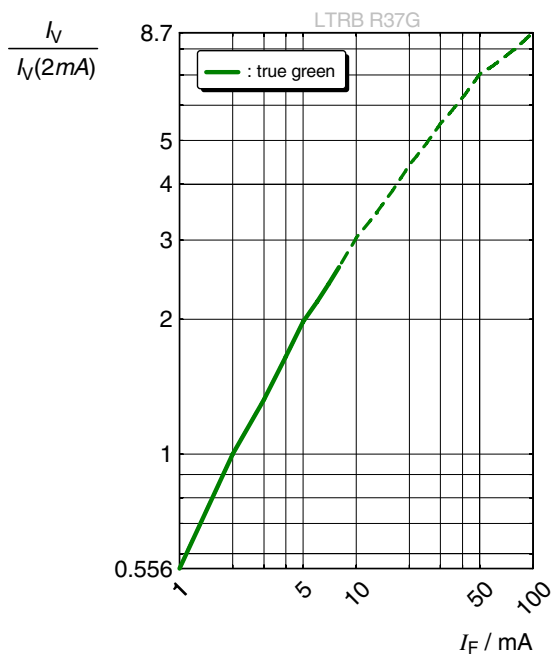
Forward current ⁵⁾

$I_F = f(V_F); T_S = 25\text{ °C}$



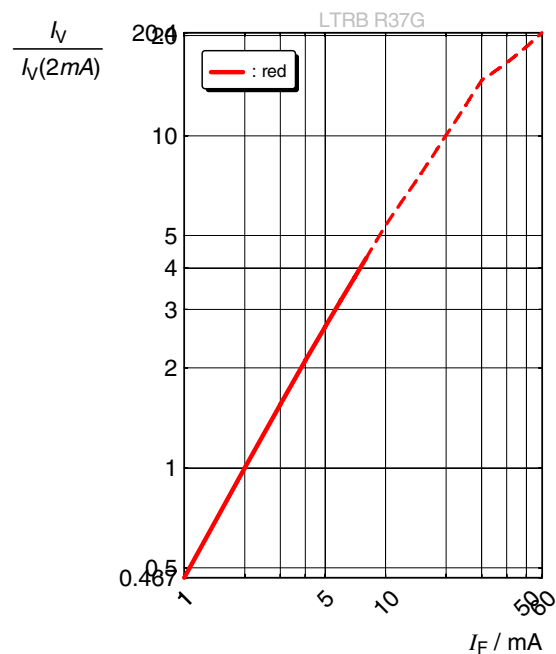
Relative Luminous Intensity ^{5), 6)}

$$I_V/I_V(2\text{ mA}) = f(I_F); T_s = 25\text{ }^\circ\text{C}$$



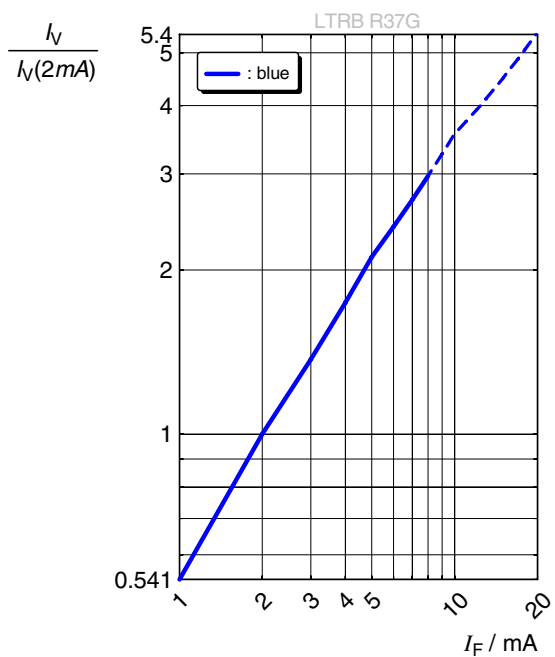
Relative Luminous Intensity ^{5), 6)}

$$I_V/I_V(2\text{ mA}) = f(I_F); T_s = 25\text{ }^\circ\text{C}$$



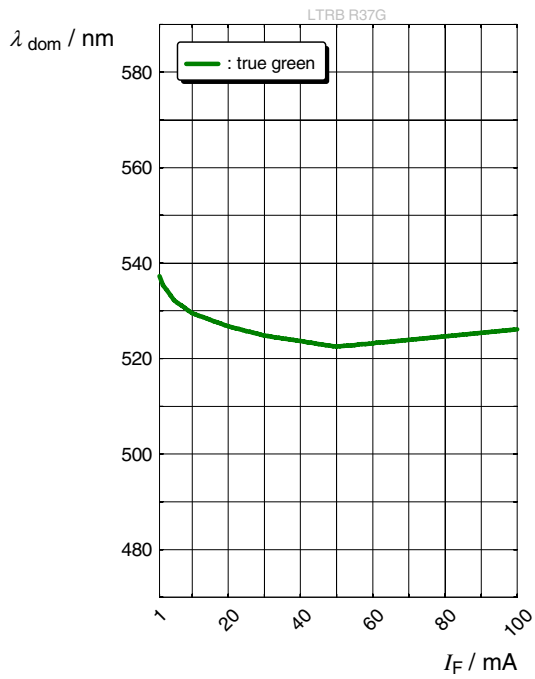
Relative Luminous Intensity ^{5), 6)}

$$I_V/I_V(2\text{ mA}) = f(I_F); T_s = 25\text{ }^\circ\text{C}$$



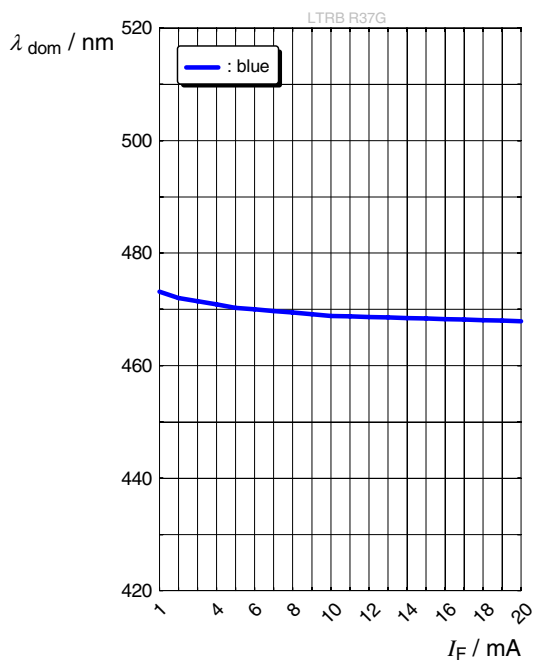
Dominant Wavelength ⁵⁾

$$\lambda_{\text{dom}} = f(I_F); T_S = 25 \text{ }^\circ\text{C}$$



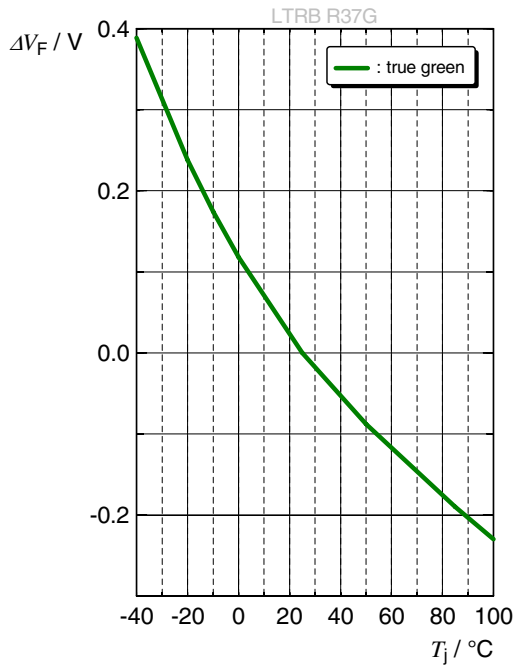
Dominant Wavelength ⁵⁾

$$\lambda_{\text{dom}} = f(I_F); T_S = 25 \text{ }^\circ\text{C}$$



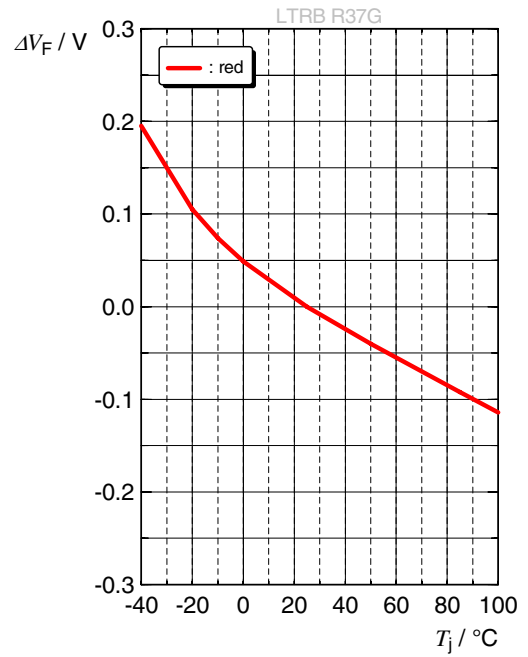
Forward Voltage ⁵⁾

$$\Delta V_F = V_F - V_F(25\text{ }^\circ\text{C}) = f(T_j); I_F = 2\text{ mA}$$



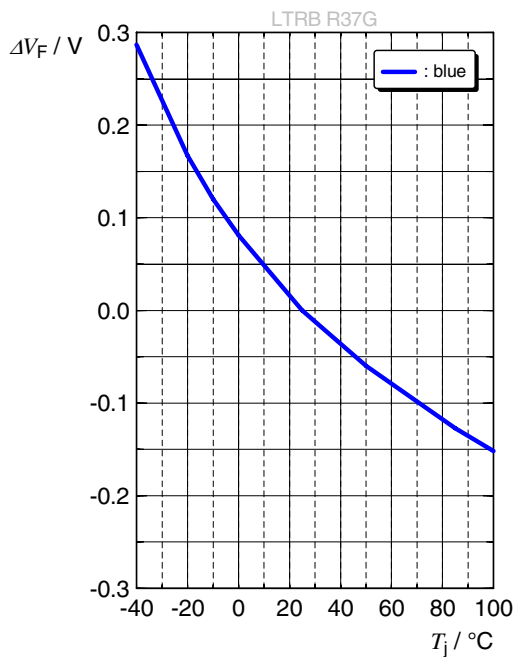
Forward Voltage ⁵⁾

$$\Delta V_F = V_F - V_F(25\text{ }^\circ\text{C}) = f(T_j); I_F = 2\text{ mA}$$



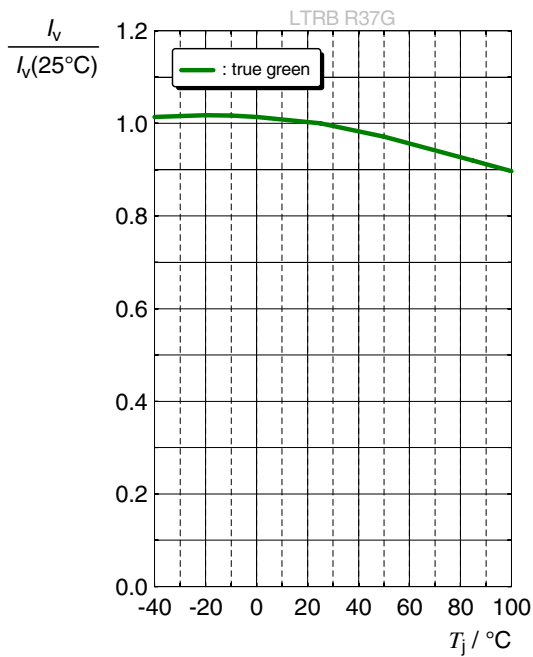
Forward Voltage ⁵⁾

$$\Delta V_F = V_F - V_F(25\text{ }^\circ\text{C}) = f(T_j); I_F = 2\text{ mA}$$



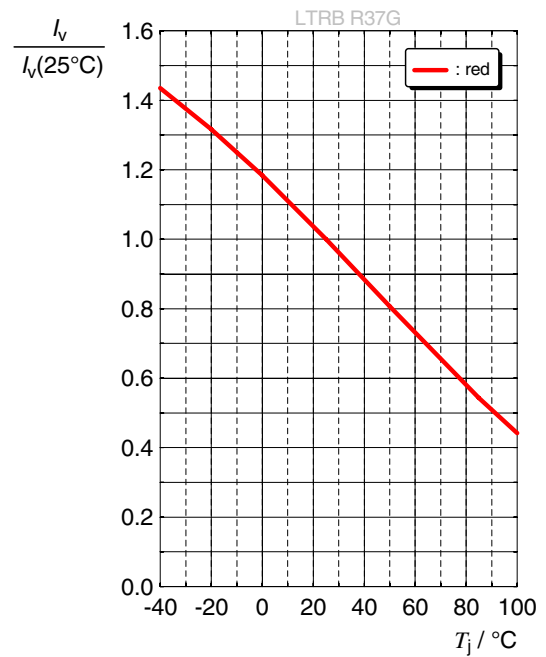
Relative Luminous Intensity ⁵⁾

$$I_v/I_v(25\text{ °C}) = f(T_j); I_F = 2\text{ mA}$$



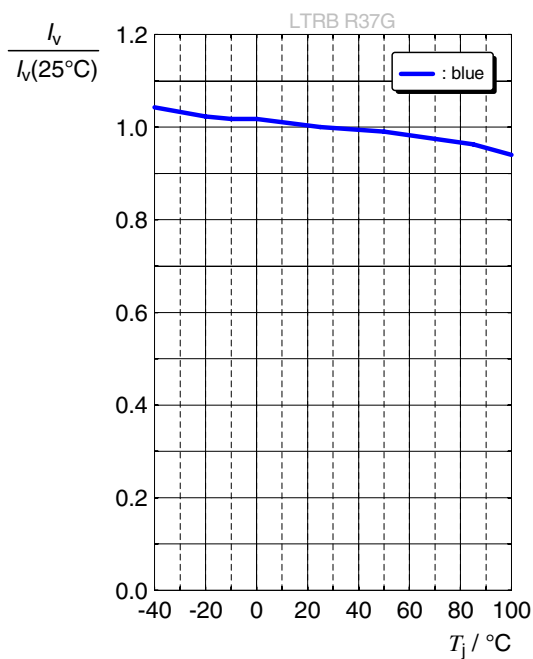
Relative Luminous Intensity ⁵⁾

$$I_v/I_v(25\text{ °C}) = f(T_j); I_F = 2\text{ mA}$$



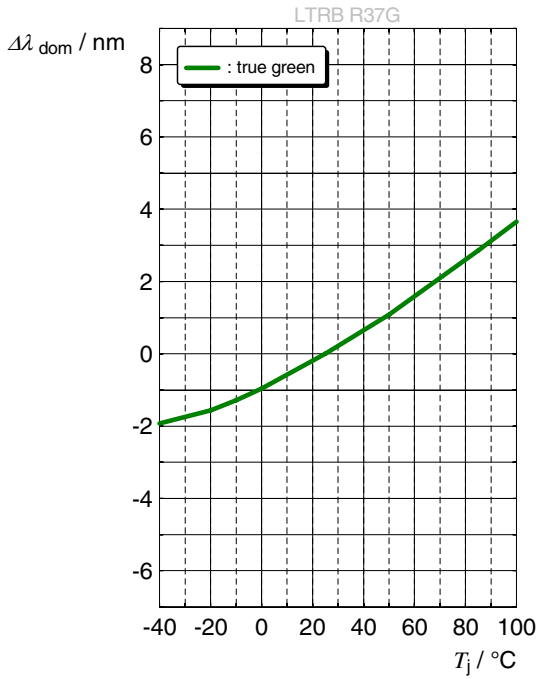
Relative Luminous Intensity ⁵⁾

$$I_v/I_v(25\text{ °C}) = f(T_j); I_F = 2\text{ mA}$$



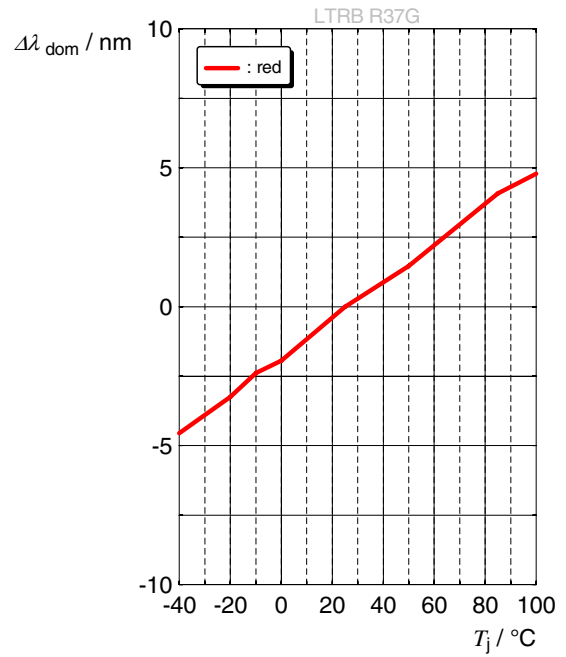
Dominant Wavelength ⁵⁾

$$\Delta\lambda_{\text{dom}} = \lambda_{\text{dom}} - \lambda_{\text{dom}}(25\text{ °C}) = f(T_j); I_F = 2\text{ mA}$$



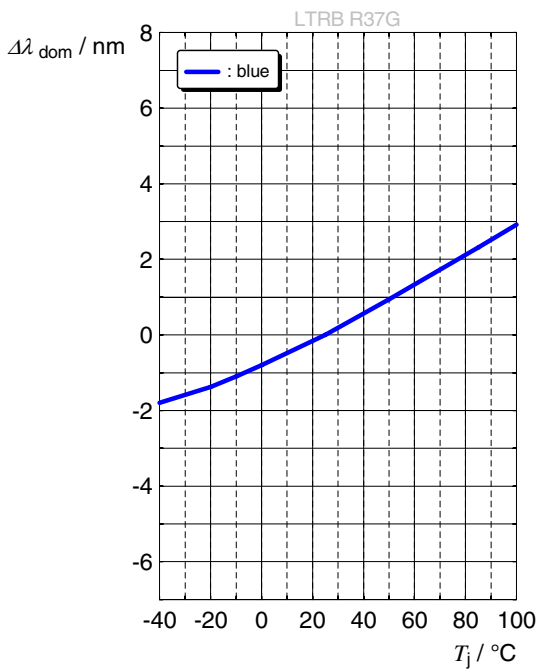
Dominant Wavelength ⁵⁾

$$\Delta\lambda_{\text{dom}} = \lambda_{\text{dom}} - \lambda_{\text{dom}}(25\text{ °C}) = f(T_j); I_F = 2\text{ mA}$$



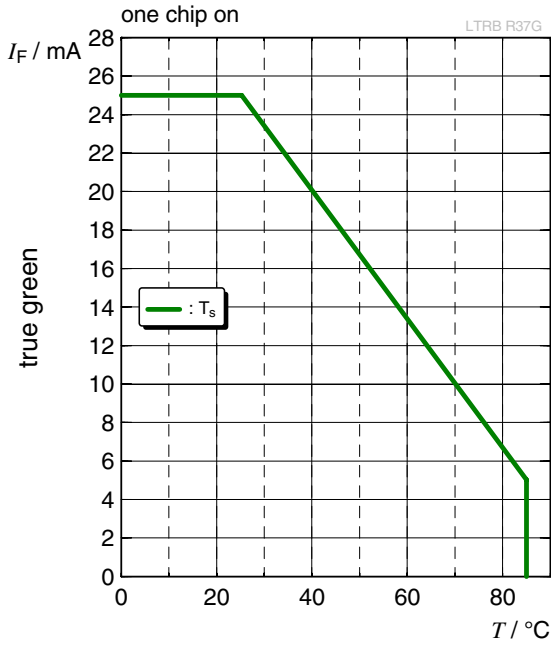
Dominant Wavelength ⁵⁾

$$\Delta\lambda_{\text{dom}} = \lambda_{\text{dom}} - \lambda_{\text{dom}}(25\text{ °C}) = f(T_j); I_F = 2\text{ mA}$$



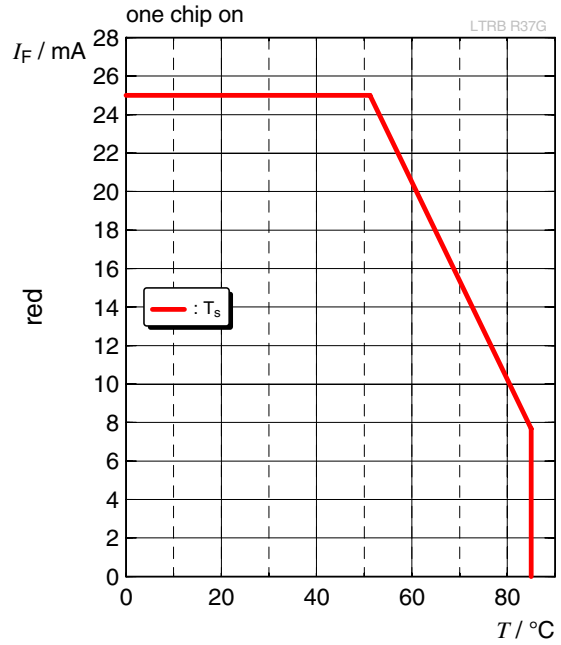
Max. Permissible Forward Current

$I_F = f(T)$; ● true green



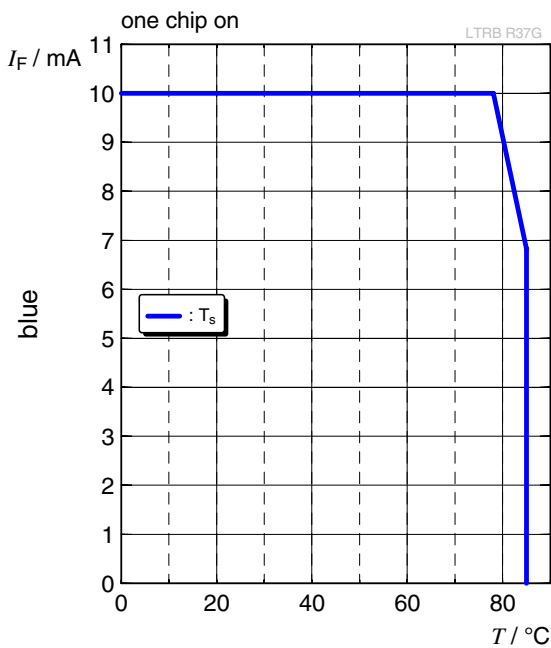
Max. Permissible Forward Current

$I_F = f(T)$; ● red



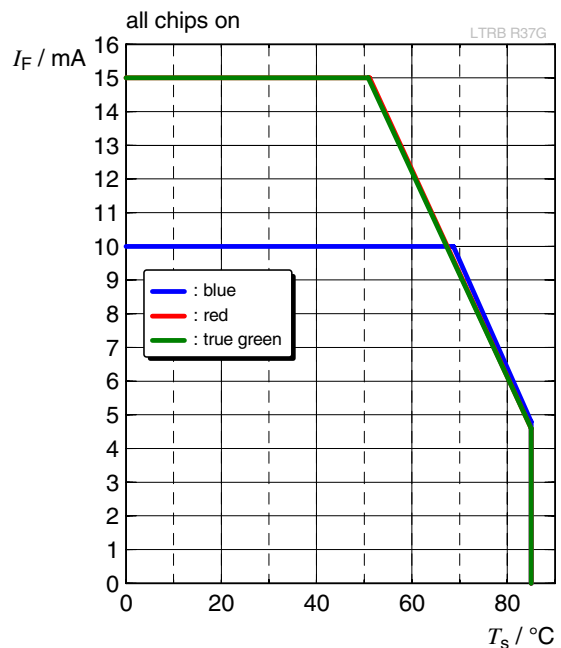
Max. Permissible Forward Current

$I_F = f(T)$; ● blue



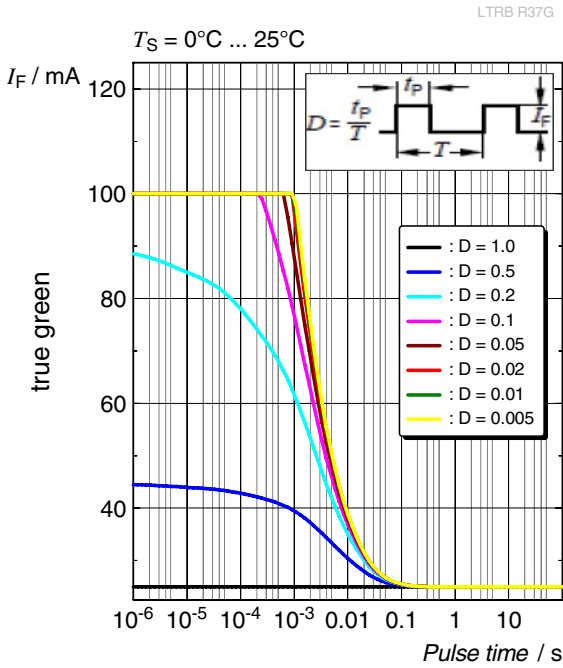
Max. Permissible Forward Current

$I_F = f(T)$; all chips on



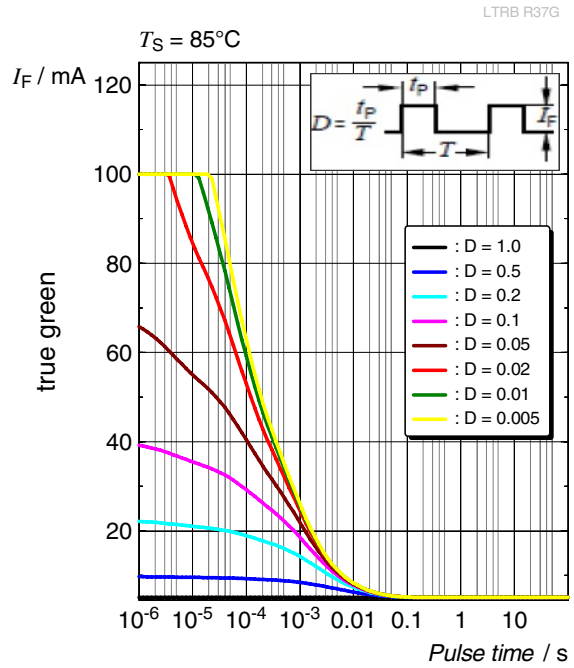
Permissible Pulse Handling Capability

$I_F = f(t_p)$; D: Duty cycle; ● true green



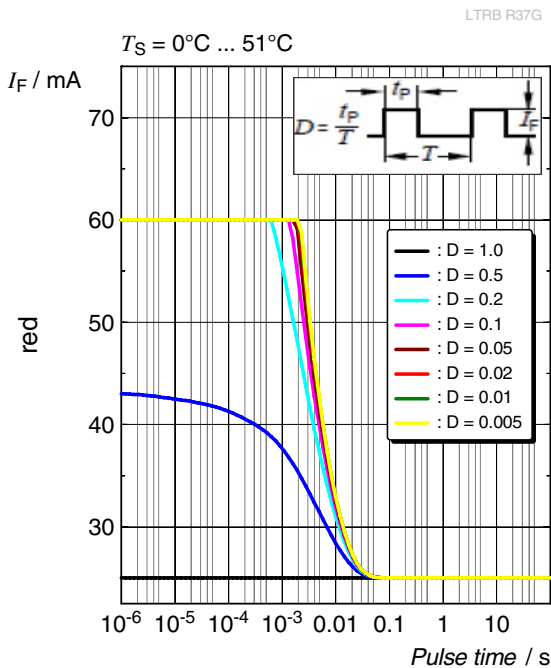
Permissible Pulse Handling Capability

$I_F = f(t_p)$; D: Duty cycle; ● true green



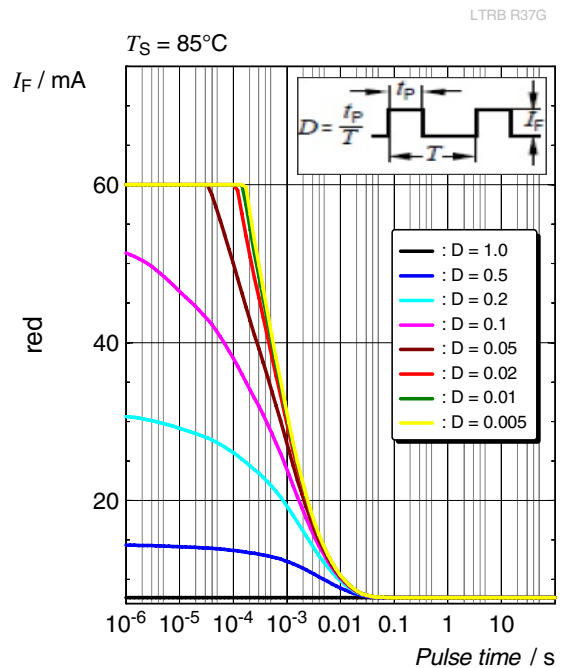
Permissible Pulse Handling Capability

$I_F = f(t_p)$; D: Duty cycle; ● red



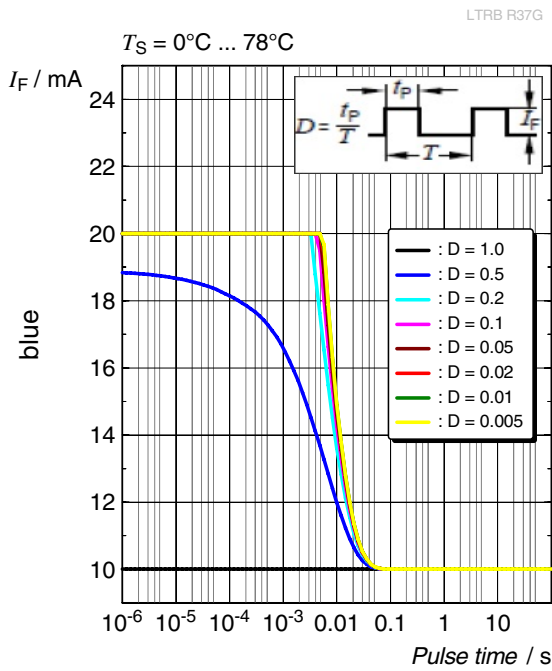
Permissible Pulse Handling Capability

$I_F = f(t_p)$; D: Duty cycle; ● red



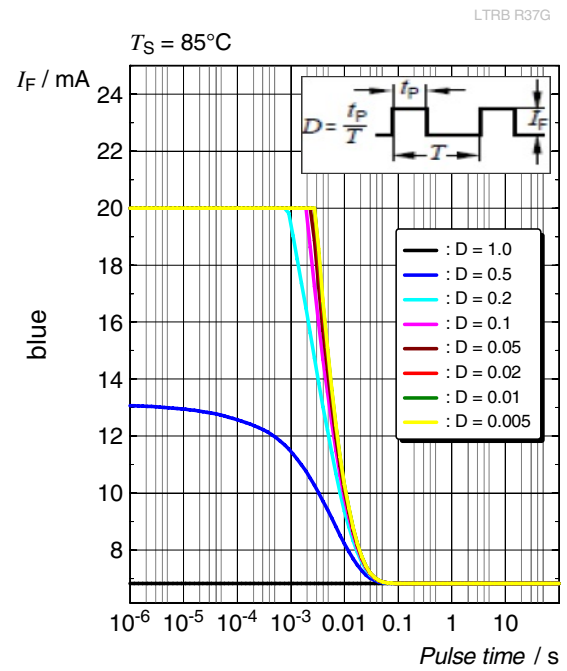
Permissible Pulse Handling Capability

$I_F = f(t_p)$; D: Duty cycle; • blue

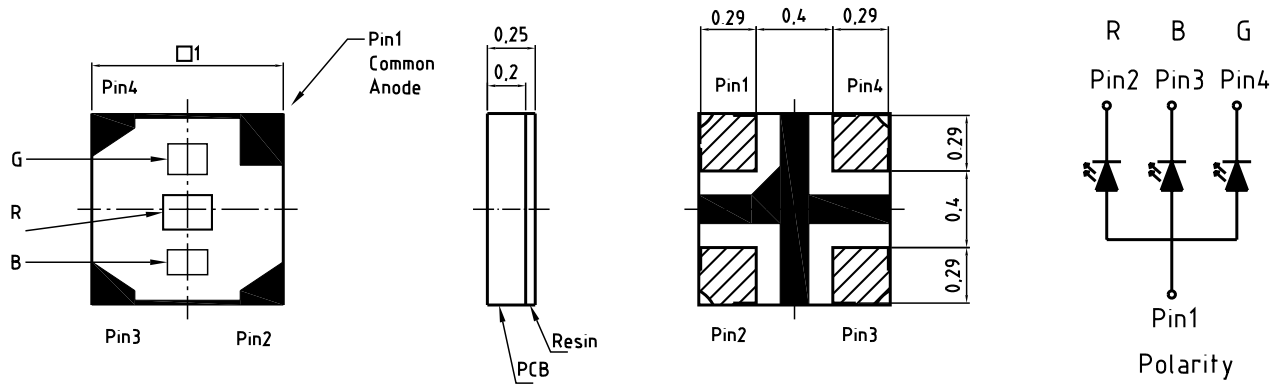



Permissible Pulse Handling Capability

$I_F = f(t_p)$; D: Duty cycle; • blue



Dimensional Drawing ⁷⁾



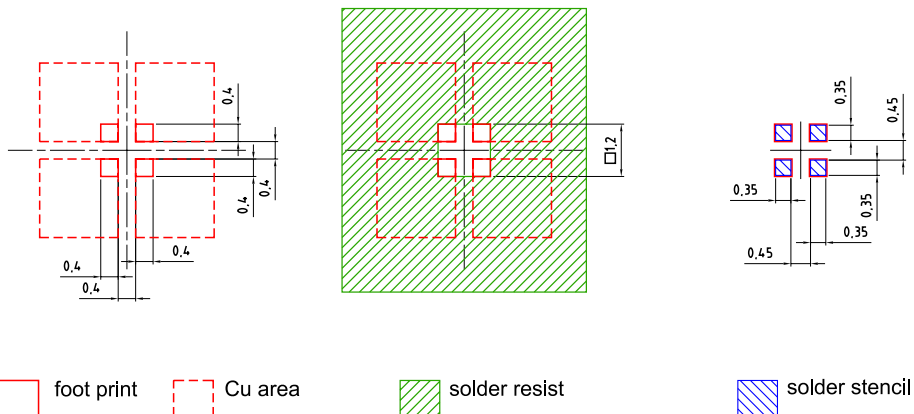
general tolerance ± 0.1
lead finish Ag 

C63062-A4366-A1-03

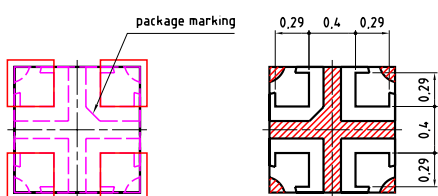
Further Information:

Approximate Weight: 0.8 mg

Recommended Solder Pad ⁷⁾



Component Location on Pad



E062.3010.233-02

For superior solder joint connectivity results we recommend soldering under standard nitrogen atmosphere. Package not suitable for ultra sonic cleaning.

Reflow Soldering Profile

Product complies to MSL Level 3 acc. to JEDEC J-STD-020E

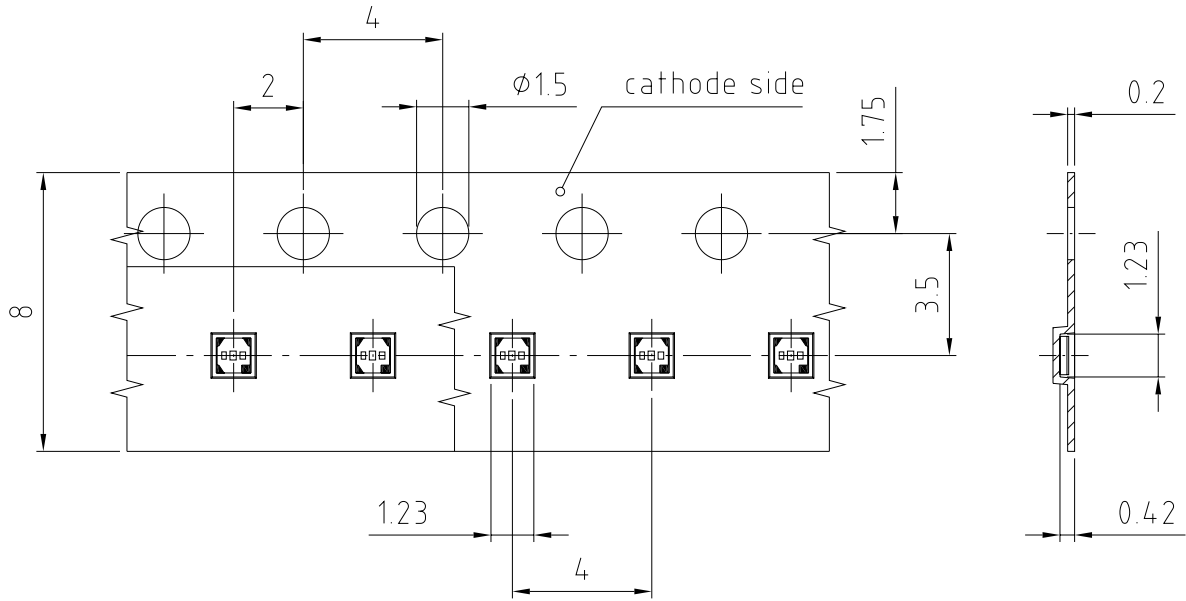


| Profile Feature | Symbol | Pb-Free (SnAgCu) Assembly | | | Unit |
|--|--------|---------------------------|----------------|---------|------|
| | | Minimum | Recommendation | Maximum | |
| Ramp-up rate to preheat ^{*)} 25 °C to 150 °C | | | 2 | 3 | K/s |
| Time t_s T_{Smin} to T_{Smax} | t_s | 60 | 100 | 120 | s |
| Ramp-up rate to peak ^{*)} T_{Smax} to T_p | | | 2 | 3 | K/s |
| Liquidus temperature | T_L | | 217 | | °C |
| Time above liquidus temperature | t_L | | 80 | 100 | s |
| Peak temperature | T_p | | 245 | 260 | °C |
| Time within 5 °C of the specified peak temperature $T_p - 5$ K | t_p | 10 | 20 | 30 | s |
| Ramp-down rate* T_p to 100 °C | | | 3 | 6 | K/s |
| Time 25 °C to T_p | | | | 480 | s |

All temperatures refer to the center of the package, measured on the top of the component

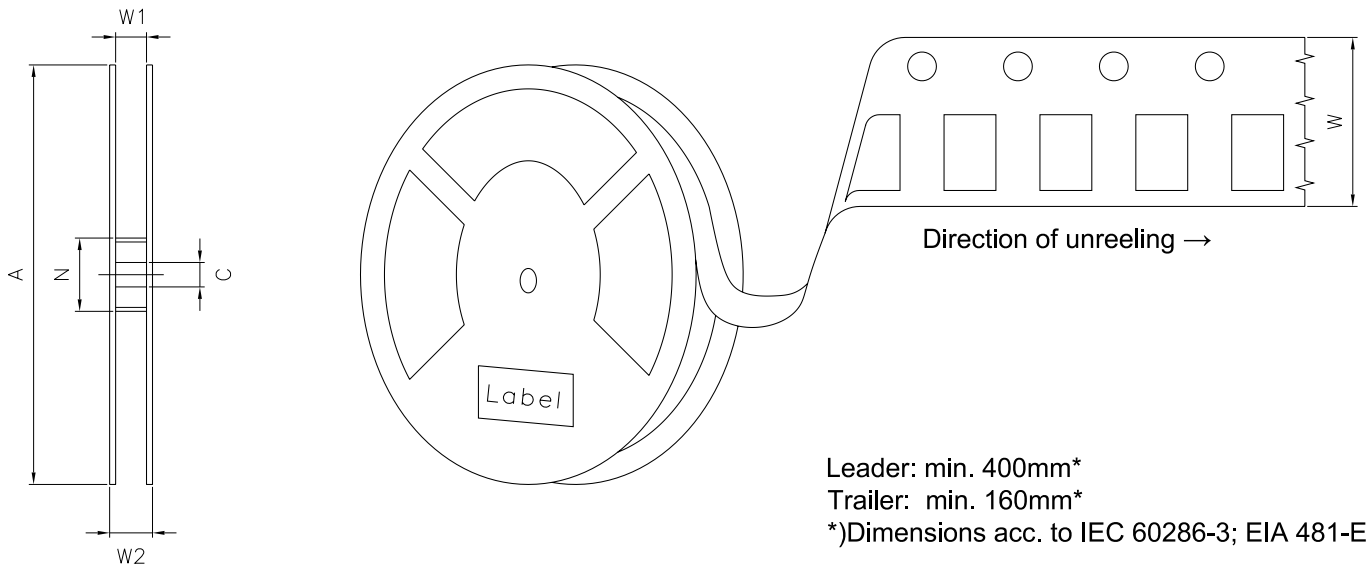
* slope calculation DT/Dt : Dt max. 5 s; fulfillment for the whole T-range

Taping ⁷⁾



C63062-A4366-B1-01

Tape and Reel ⁸⁾



Reel Dimensions

| A | W | N _{min} | W ₁ | W _{2 max} | Pieces per PU |
|--------|--------------------|------------------|----------------|--------------------|---------------|
| 180 mm | 8 + 0.3 / - 0.1 mm | 60 mm | 8.4 + 2 mm | 14.4 mm | 4000 |

Barcode-Product-Label (BPL)

OSRAM Opto Semiconductors LX XXXX BIN1: XX-XX-X-XXX-X






RoHS Compliant

(6P) BATCH NO: 1234567890 ML Temp ST
X XXX °C X

(1T) LOT NO: 1234567890 (9D) D/C: 1234

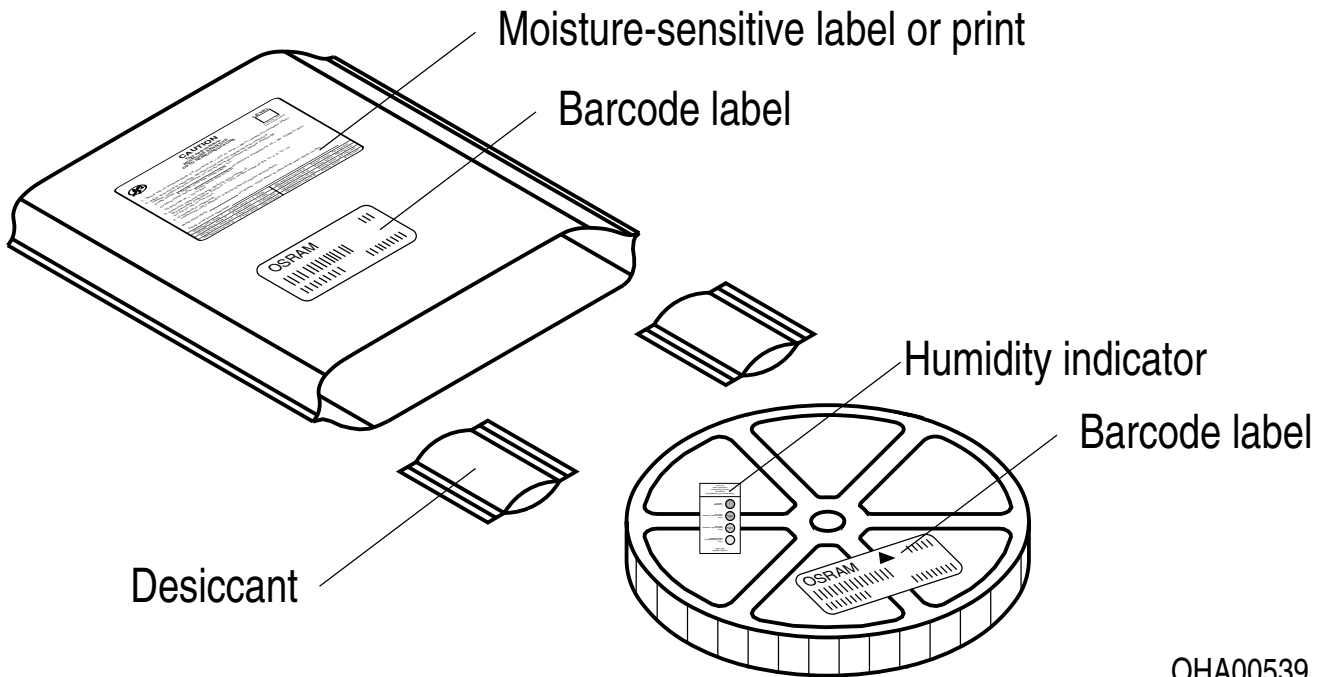
Pack: RXX
DEMY XXX
X_X123_1234.1234 X

(X) PROD NO: 123456789(Q)QTY: 9999 (G) GROUP: XX-XX-X-X

OHA04563

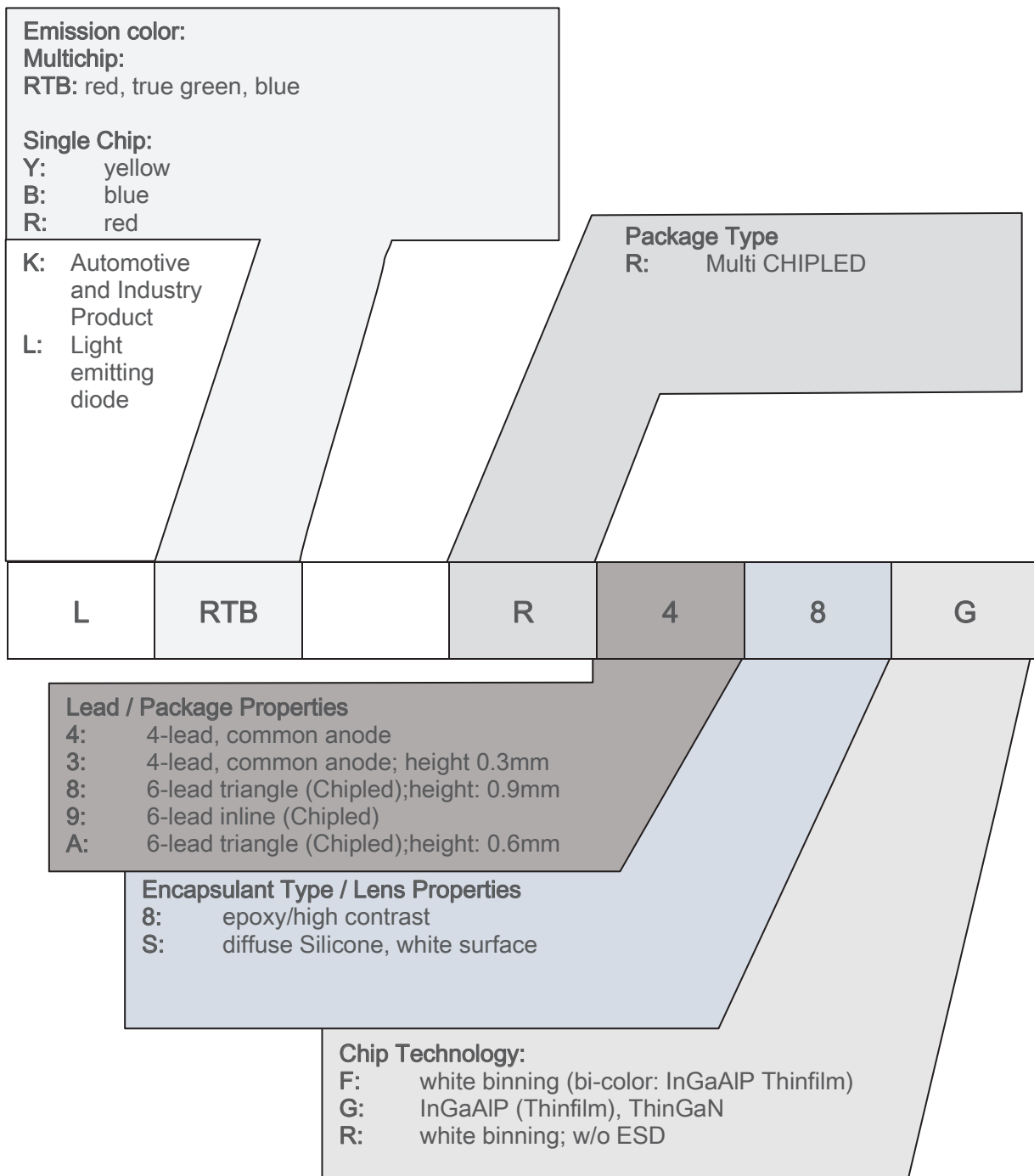
Dry Packing Process and Materials ⁷⁾



OHA00539

Moisture-sensitive product is packed in a dry bag containing desiccant and a humidity card according JEDEC-STD-033.

Type Designation System



Notes

The evaluation of eye safety occurs according to the standard IEC 62471:2006 (photo biological safety of lamps and lamp systems). Within the risk grouping system of this IEC standard, the device specified in this data sheet fall into the class **exempt group (exposure time 10000 s)**. Under real circumstances (for exposure time, conditions of the eye pupils, observation distance), it is assumed that no endangerment to the eye exists from these devices. As a matter of principle, however, it should be mentioned that intense light sources have a high secondary exposure potential due to their blinding effect. When looking at bright light sources (e.g. headlights), temporary reduction in visual acuity and afterimages can occur, leading to irritation, annoyance, visual impairment, and even accidents, depending on the situation.

Subcomponents of this device contain, in addition to other substances, metal filled materials including silver. Metal filled materials can be affected by environments that contain traces of aggressive substances. Therefore, we recommend that customers minimize device exposure to aggressive substances during storage, production, and use. Devices that showed visible discoloration when tested using the described tests above did show no performance deviations within failure limits during the stated test duration. Respective failure limits are described in the IEC60810.

Changes to the content of this datasheet may occur without further notification. JEDEC 46C constitutes the guideline of the change management for the device specified in this document.

For further application related information please visit www.osram-os.com/appnotes

Disclaimer

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 on our website.

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.

Product and functional safety devices/applications or medical devices/applications

Our components are not developed, constructed or tested for the application as safety relevant component or for the application in medical devices.

Our products are not qualified at module and system level for such application.

In case buyer – or customer supplied by buyer – considers using our components in product safety devices/ applications or medical devices/applications, buyer and/or customer has to inform our local sales partner immediately and we and buyer and /or customer will analyze and coordinate the customer-specific request between us and buyer and/or customer.

Glossary

- 1) **Wavelength:** Wavelengths are tested at a current pulse duration of 25 ms and a tolerance of ± 1 nm.
- 2) **Forward Voltage:** Forward voltages are tested at a current pulse duration of 1 ms and a tolerance of ± 0.1 V.
- 3) **Thermal Resistance:** $R_{th\ max}$ is based on statistic values (6σ).
- 4) **Brightness:** Brightness groups are tested at a current pulse duration of 25 ms and a tolerance of ± 11 %.
- 5) **Typical Values:** Due to the special conditions of the manufacturing processes of semiconductor devices, the typical data or calculated correlations of technical parameters can only reflect statistical figures. These do not necessarily correspond to the actual parameters of each single product, which could differ from the typical data and calculated correlations or the typical characteristic line. If requested, e.g. because of technical improvements, these typ. data will be changed without any further notice.
- 6) **Characteristic curve:** In the range where the line of the graph is broken, you must expect higher differences between single devices within one packing unit.
- 7) **Tolerance of Measure:** Unless otherwise noted in drawing, tolerances are specified with ± 0.1 and dimensions are specified in mm.
- 8) **Tape and Reel:** All dimensions and tolerances are specified acc. IEC 60286-3 and specified in mm.

Revision History

| Version | Date | Change |
|---------|------------|----------------------|
| 1.0 | 2019-01-02 | Initial Version |
| 1.1 | 2019-07-31 | Ordering Information |
| 1.2 | 2021-09-30 | Brand |
| 1.3 | 2022-05-05 | Brand New Layout |



EU RoHS and China RoHS compliant product

此产品符合欧盟 RoHS 指令的要求；
按照中国的相关法规和标准，
不含有毒有害物质或元素。

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