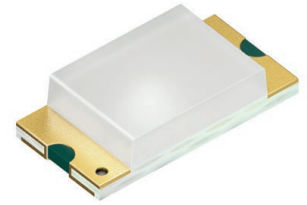


LT Q39G

CHIPLED® 0603



Applications

- Electronic Equipment
- Gaming, Amusement, Gambling
- White Goods

Features:

- Package: SMT package 0603, colorless diffused resin
- Chip technology: InGaN on Sapphire
- Typ. Radiation: 170° (horizontal), 130° (vertical)
- Color: $\lambda_{\text{dom}} = 530 \text{ nm}$ (● true green)
- Corrosion Robustness Class: 3B
- ESD: 1 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM)

Ordering Information

| Type | Luminous Intensity ¹⁾ $I_F = 5 \text{ mA}$ I_v | Ordering Code |
|-------------------|---|---------------|
| LT Q39G-Q100-25-1 | $\geq 71 \text{ mcd}$ | Q65110A7997 |

Maximum Ratings

| Parameter | Symbol | | Values |
|--|-----------|--------------|-----------------|
| Operating Temperature | T_{op} | min. max. | -30 °C 85 °C |
| Storage Temperature | T_{stg} | min. max. | -40 °C 85 °C |
| Junction Temperature | T_j | max. | 95 °C |
| Forward current $T_A = 25\text{ °C}$ | I_F | max. | 15 mA |
| Surge Current $t \leq 10\text{ }\mu\text{s}$; $D = 0.005$; $T_A = 25\text{ °C}$ | I_{FS} | max. | 100 mA |
| Reverse voltage ²⁾ $T_A = 25\text{ °C}$ | V_R | max. | 12 V |
| ESD withstand voltage acc. to ANSI/ESDA/JEDEC JS-001 (HBM) | V_{ESD} | | 1 kV |

Characteristics

$I_F = 5 \text{ mA}$; $T_A = 25 \text{ °C}$

| Parameter | Symbol | | Values |
|--|-------------------------|------|--------------------|
| Peak Wavelength | λ_{peak} | typ. | 525 nm |
| Dominant Wavelength ³⁾ | λ_{dom} | min. | 520 nm |
| | | typ. | 530 nm |
| | | max. | 540 nm |
| Spectral Bandwidth at 50% $I_{\text{rel,max}}$ | $\Delta\lambda$ | typ. | 30 nm |
| Viewing angle at 50% I_V values for 0°, 90° | 2φ | typ. | 170 ° |
| | | typ. | 130 ° |
| Forward Voltage ⁴⁾ $I_F = 5 \text{ mA}$ | V_F | min. | 2.60 V |
| | | typ. | 2.85 V |
| | | max. | 3.10 V |
| Reverse current ²⁾ $V_R = 12 \text{ V}$ | I_R | typ. | 0.01 μA |
| | | max. | 10 μA |
| Real thermal resistance junction/ambient ⁵⁾⁶⁾ | $R_{\text{thJA real}}$ | max. | 650 K / W |
| Real thermal resistance junction/solderpoint ⁵⁾ | $R_{\text{thJS real}}$ | max. | 370 K / W |

Brightness Groups

| Group | Luminous Intensity ¹⁾ $I_F = 5 \text{ mA}$ min. I_v | Luminous Intensity ¹⁾ $I_F = 5 \text{ mA}$ max. I_v | Luminous Flux ⁷⁾ $I_F = 5 \text{ mA}$ typ. Φ_v |
|-------|---|---|---|
| Q1 | 71 mcd | 90 mcd | 340 mlm |
| Q2 | 90 mcd | 112 mcd | 420 mlm |
| R1 | 112 mcd | 140 mcd | 530 mlm |
| R2 | 140 mcd | 180 mcd | 670 mlm |
| S1 | 180 mcd | 224 mcd | 850 mlm |
| S2 | 224 mcd | 280 mcd | 1060 mlm |
| T1 | 280 mcd | 355 mcd | 1330 mlm |
| T2 | 355 mcd | 450 mcd | 1690 mlm |

Forward Voltage Groups

| Group | Forward Voltage ⁴⁾ $I_F = 5 \text{ mA}$ min. V_F | Forward Voltage ⁴⁾ $I_F = 5 \text{ mA}$ max. V_F |
|-------|--|--|
| 3X | 2.60 V | 2.70 V |
| 3Y | 2.70 V | 2.80 V |
| 3Z | 2.80 V | 2.90 V |
| 4X | 2.90 V | 3.00 V |
| 4Y | 3.00 V | 3.10 V |

Wavelength Groups

| Group | Dominant Wavelength ³⁾ min. λ_{dom} | Dominant Wavelength ³⁾ max. λ_{dom} |
|-------|---|---|
| 2 | 520 nm | 525 nm |
| 3 | 525 nm | 530 nm |
| 4 | 530 nm | 535 nm |
| 5 | 535 nm | 540 nm |

Group Name on Label

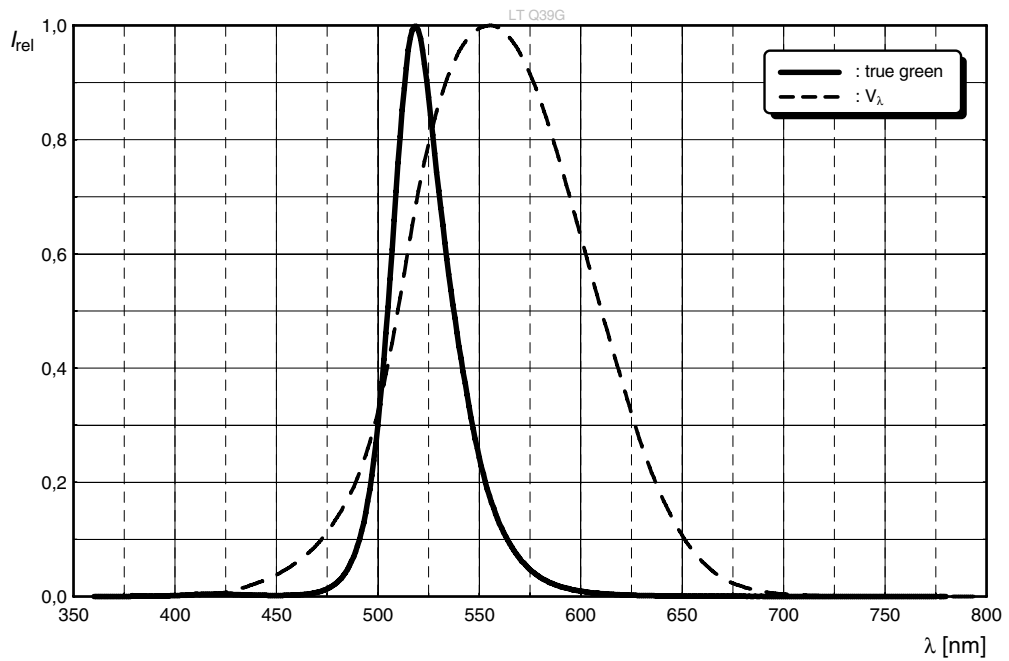
Example: Q1-2-3X

Group Name on Label

| Brightness | Wavelength | Forward Voltage |
|------------|------------|-----------------|
| Q1 | 2 | 3X |

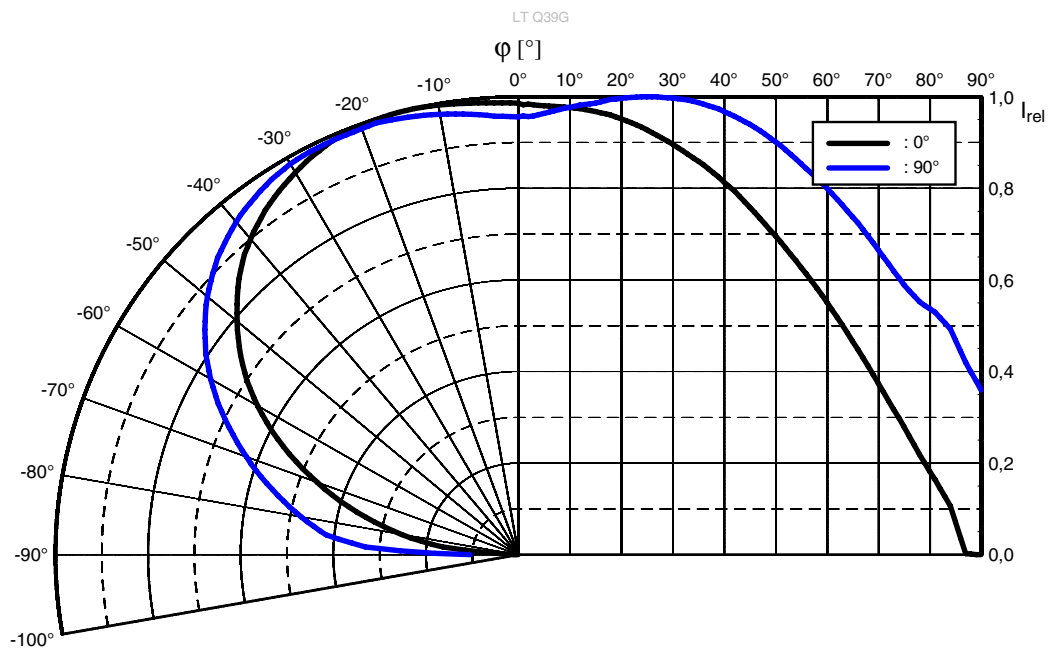
Relative Spectral Emission ⁷⁾

$I_{rel} = f(\lambda); I_F = 5 \text{ mA}; T_A = 25 \text{ }^\circ\text{C}$



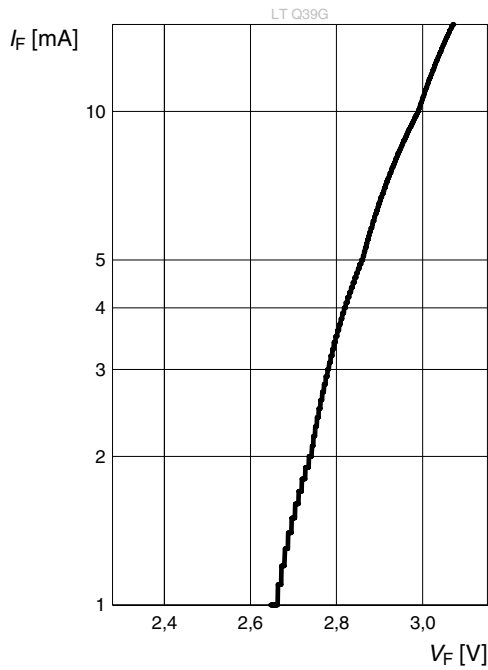
Radiation Characteristics ⁷⁾

$I_{rel} = f(\phi); T_A = 25 \text{ }^\circ\text{C}$



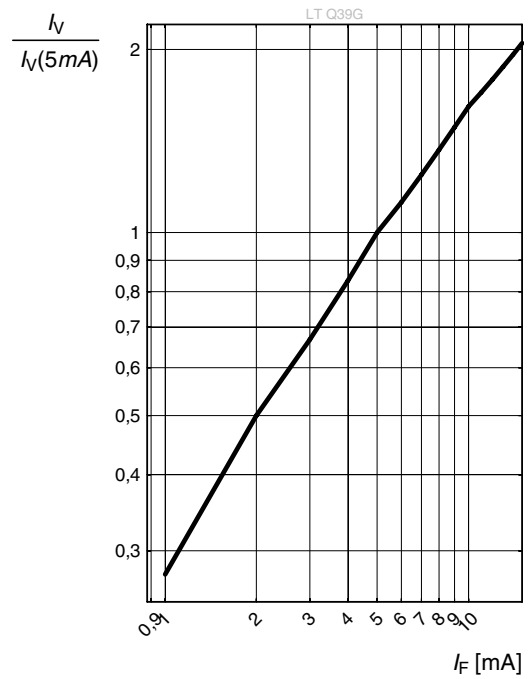
Forward current 7), 8)

$I_F = f(V_F); T_A = 25\text{ }^\circ\text{C}$



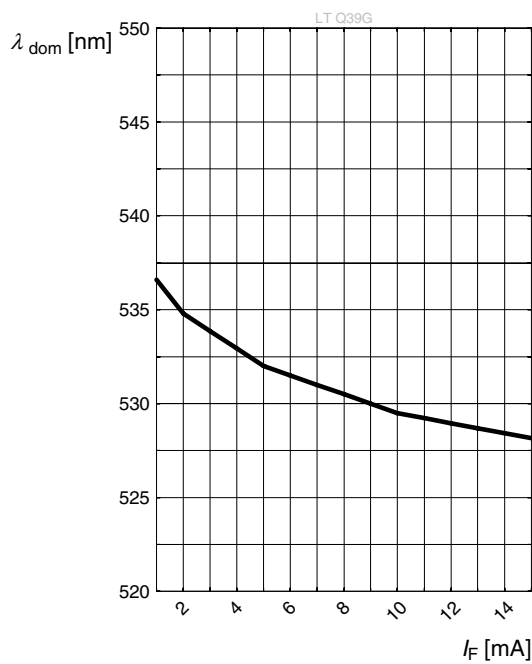
Relative Luminous Intensity 7), 8)

$I_V/I_V(5\text{ mA}) = f(I_F); T_A = 25\text{ }^\circ\text{C}$



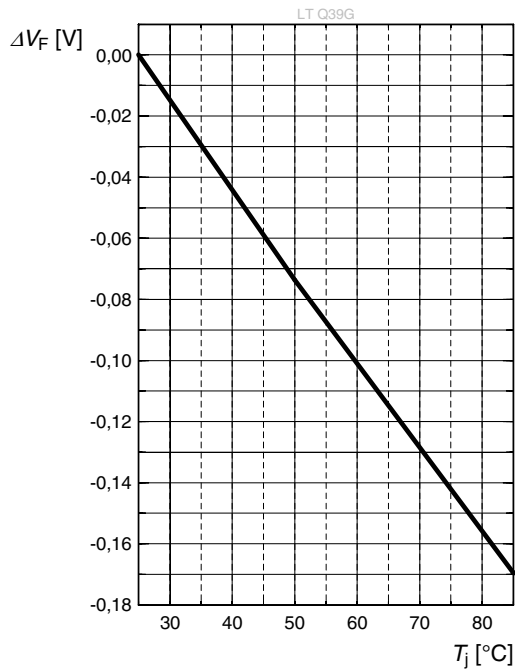
Dominant Wavelength 7)

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



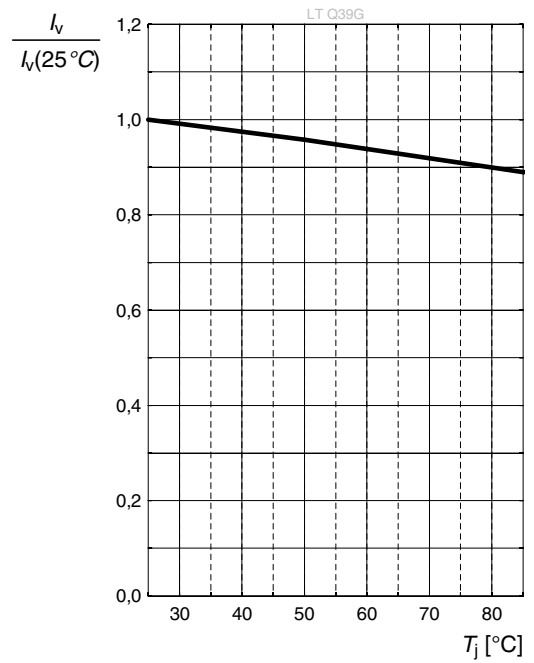
Forward Voltage ⁷⁾

$$\Delta V_F = V_F - V_F(25\text{ °C}) = f(T_j); I_F = 5\text{ mA}$$



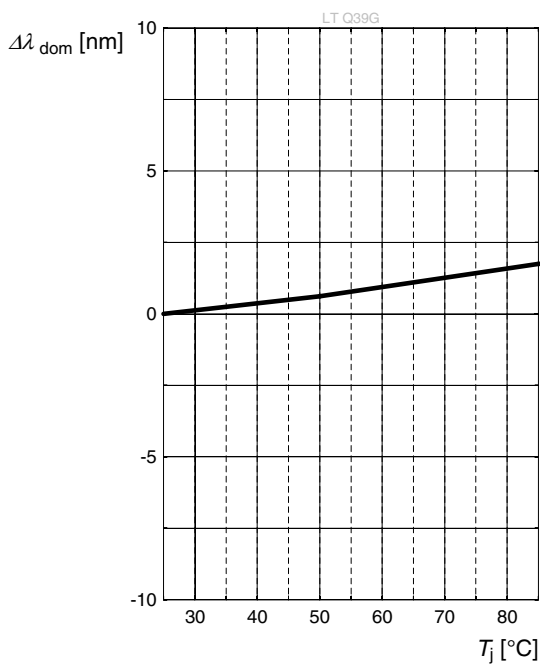
Relative Luminous Intensity ⁷⁾

$$I_V/I_V(25\text{ °C}) = f(T_j); I_F = 5\text{ mA}$$



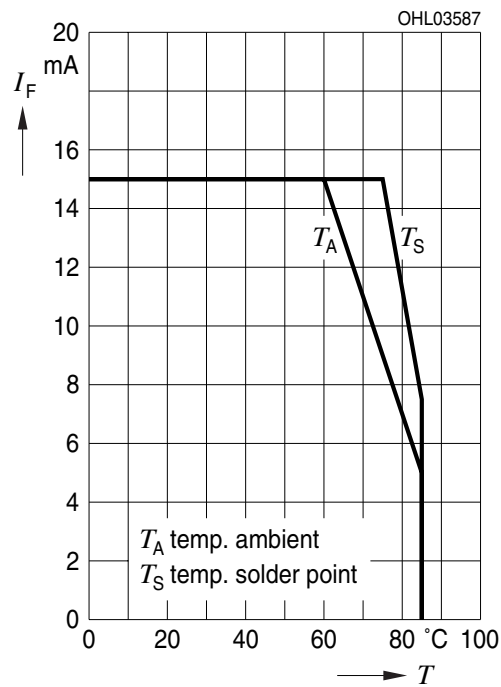
Dominant Wavelength ⁷⁾

$$\Delta \lambda_{\text{dom}} = \lambda_{\text{dom}} - \lambda_{\text{dom}}(25\text{ °C}) = f(T_j); I_F = 5\text{ mA}$$



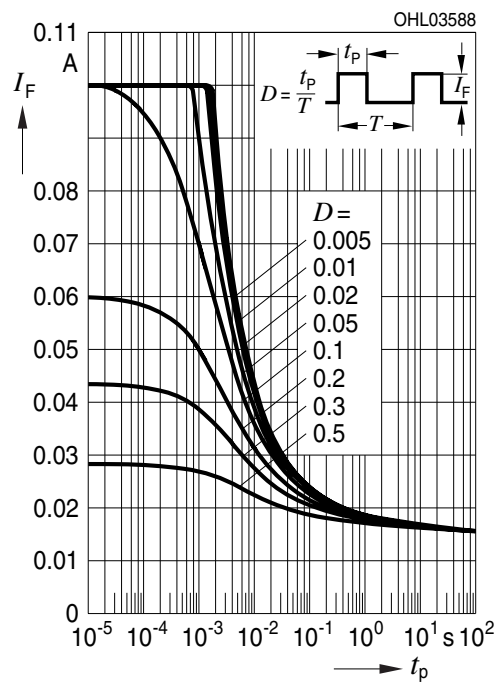
Max. Permissible Forward Current

$I_F = f(T)$



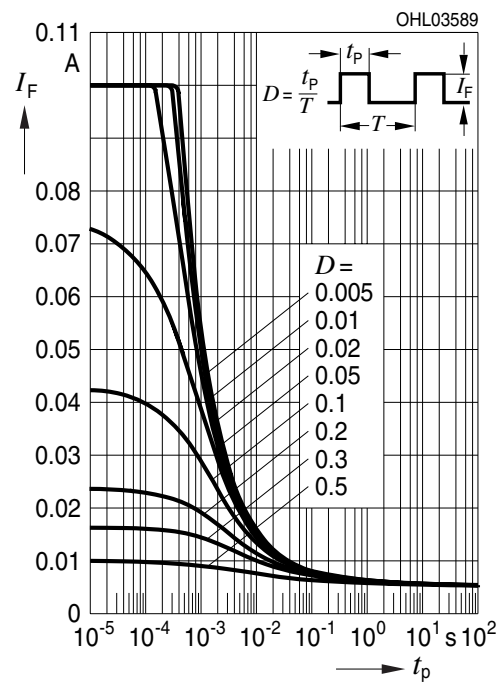
Permissible Pulse Handling Capability

$I_F = f(t_p)$; D: Duty cycle; $T_A = 25\text{ °C}$

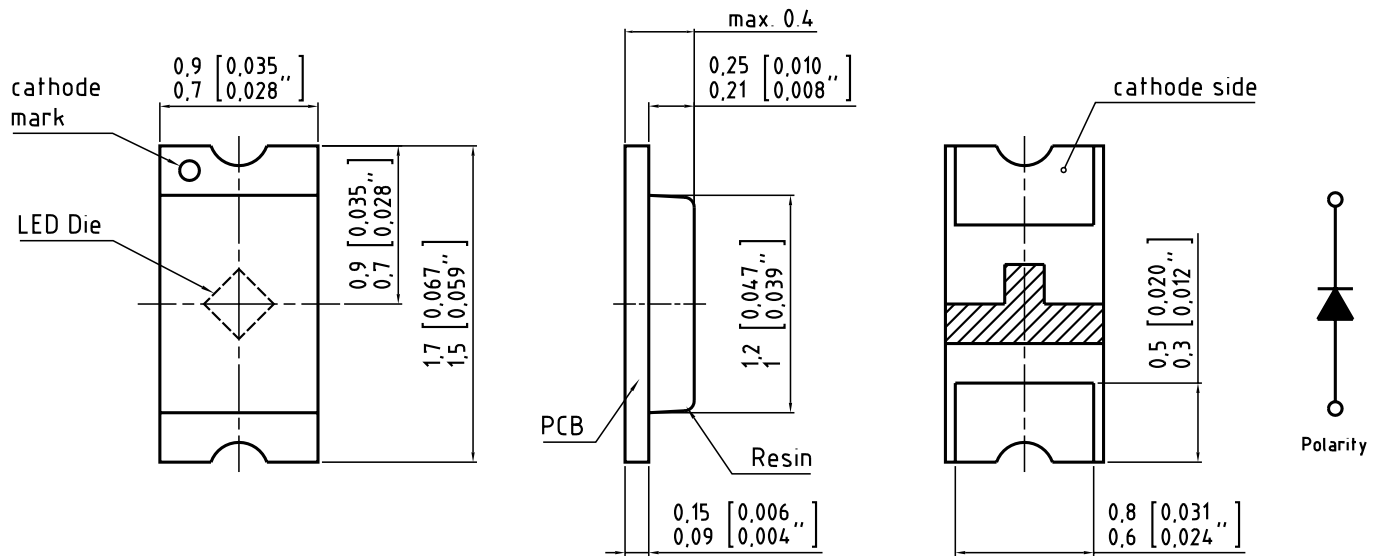


Permissible Pulse Handling Capability

$I_F = f(t_p)$; D: Duty cycle; $T_A = 85\text{ °C}$



Dimensional Drawing ⁹⁾



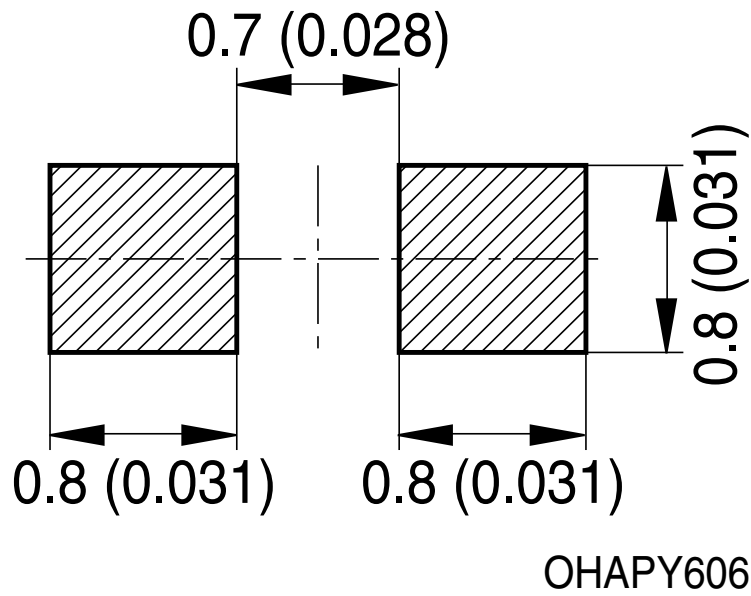
C63062-A4.006-A1.-06

Further Information:

Approximate Weight: 1.0 mg

Corrosion test: Class: 3B
 Test condition: 40°C / 90 % RH / 15 ppm H₂S / 14 days (stricter than IEC 60068-2-43)

Recommended Solder Pad ⁹⁾



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

Reflow Soldering Profile

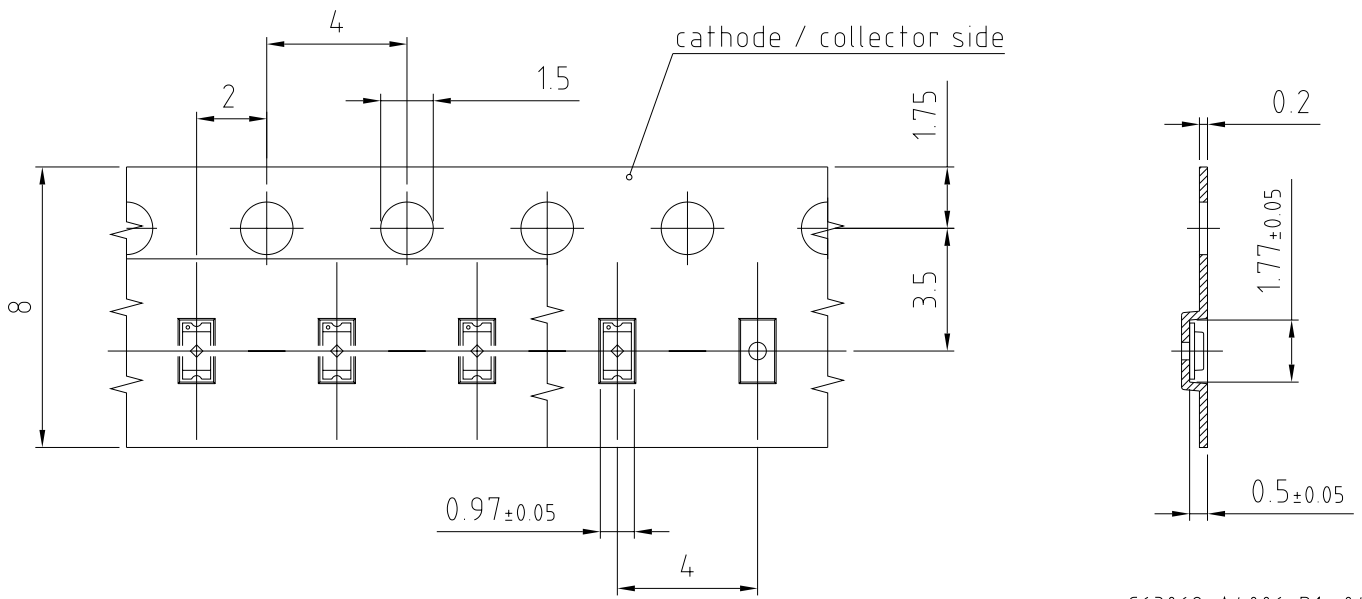
Product complies to MSL Level 2 acc. to JEDEC J-STD-020E



| 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 ⁹⁾



C63062-A4006-B1-04

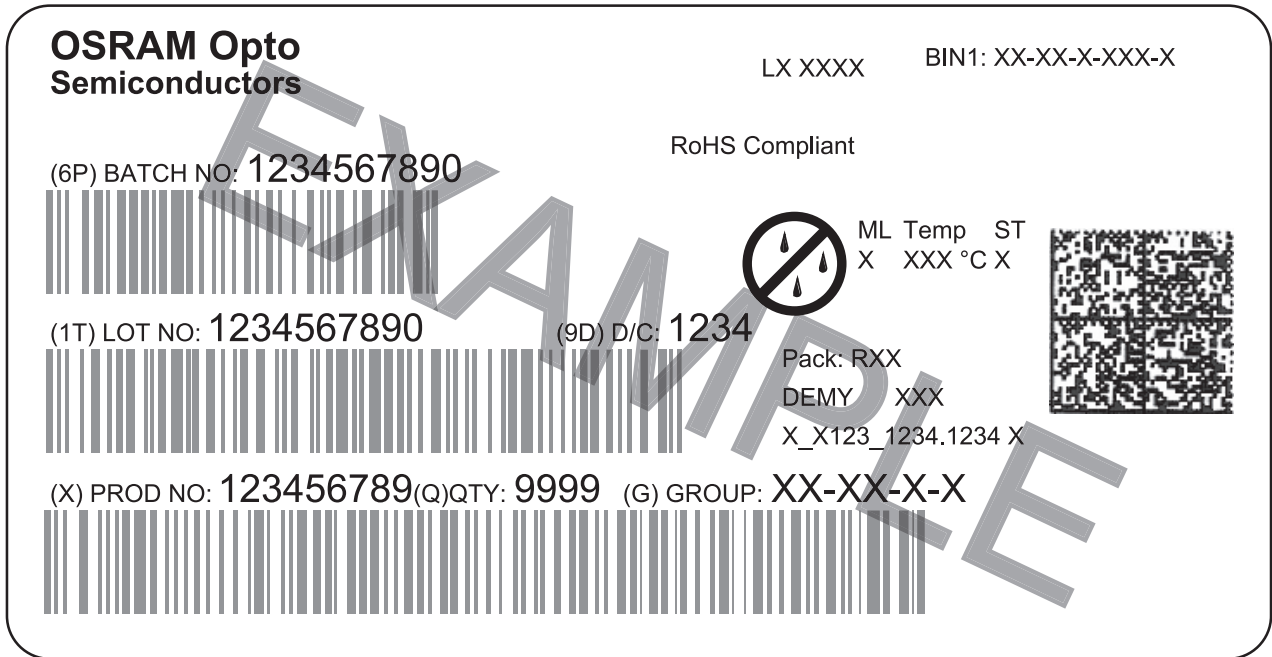
Tape and Reel ¹⁰⁾



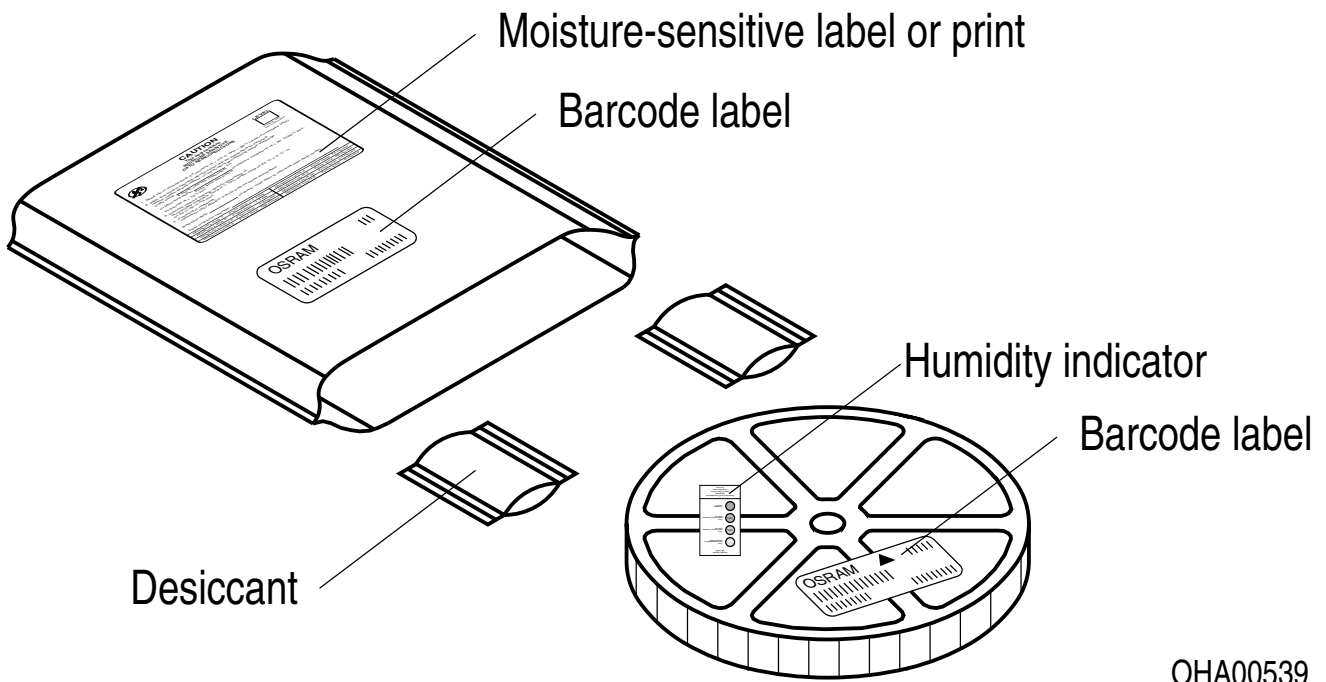
Reel Dimensions

| A | W | N_{min} | W_1 | W_{2max} | 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)

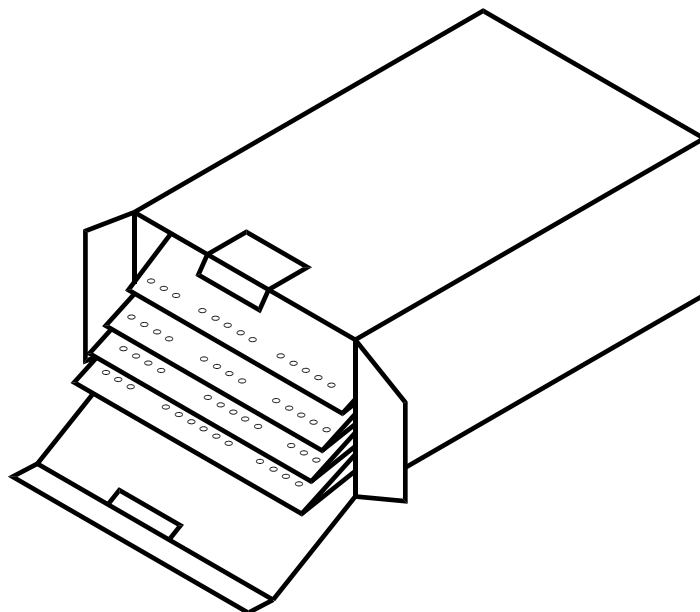


Dry Packing Process and Materials ⁹⁾



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

Schematic Transportation Box ⁹⁾



C63062-A3437-X121-01

Dimensions of Transportation Box

Width

Length

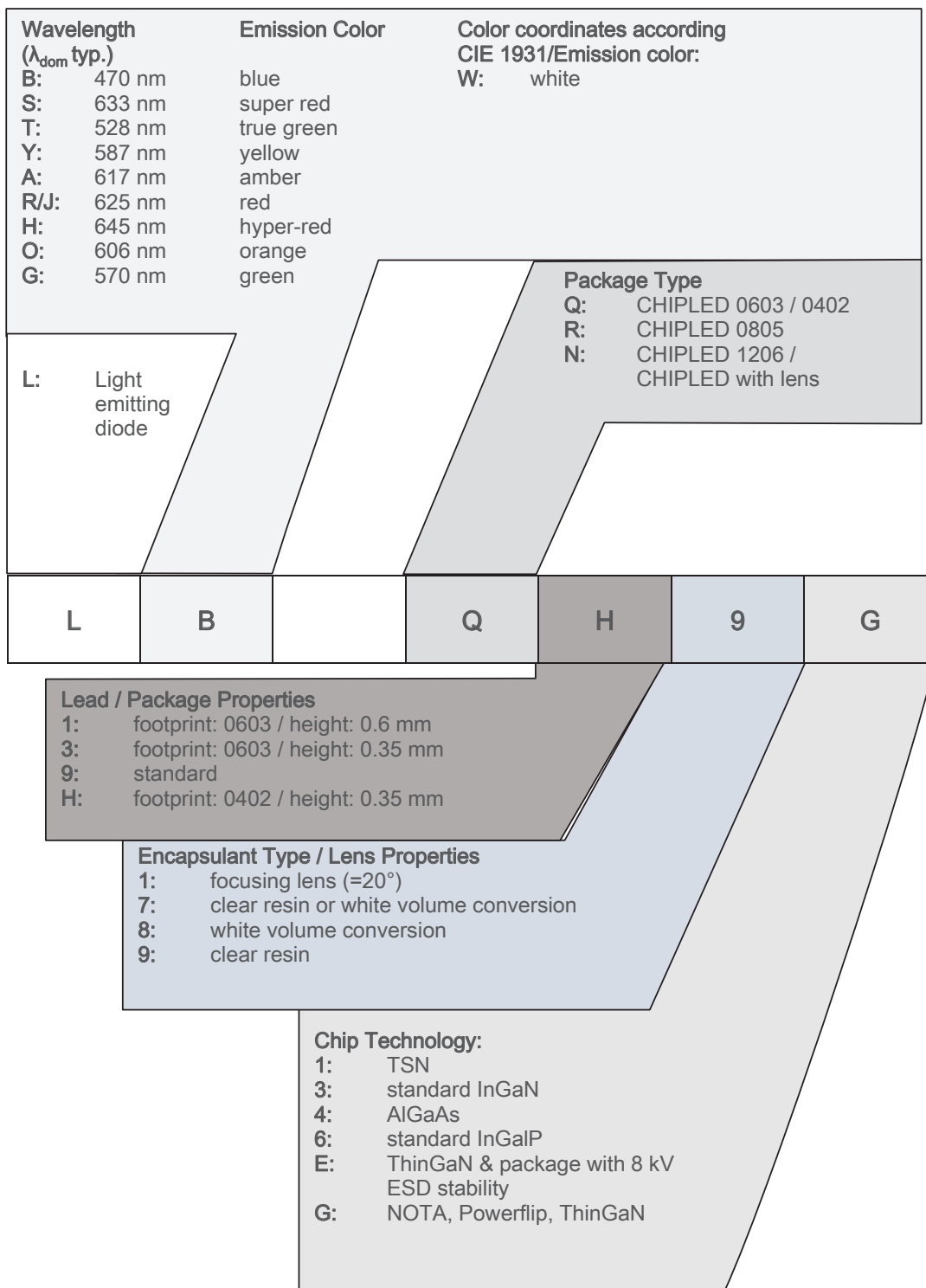
Height

260 ± 5 mm

230 ± 5 mm

85 ± 5 mm

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 falls 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.

Based on very short life cycle times in chip technology this component is subject to frequent adaption to the latest chip technology.

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 the OSRAM OS 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

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

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

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

Glossary

- 1) **Brightness:** Brightness groups are tested at a current pulse duration of 25 ms and a tolerance of $\pm 11\%$.
- 2) **Reverse Operation:** Reverse Operation of 10 hours is permissible in total. Continuous reverse operation is not allowed.
- 3) **Wavelength:** Wavelengths are tested at a current pulse duration of 25 ms and a tolerance of ± 1 nm.
- 4) **Forward Voltage:** Forward voltages are tested at a current pulse duration of 1 ms and a tolerance of ± 0.1 V.
- 5) **Thermal Resistance:** $R_{th\ max}$ is based on statistic values (6σ).
- 6) **Thermal Resistance:** R_{thJA} results from mounting on PC board FR 4 (pad size ≥ 5 mm² per pad)
- 7) **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.
- 8) **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.
- 9) **Tolerance of Measure:** Unless otherwise noted in drawing, tolerances are specified with ± 0.1 and dimensions are specified in mm.
- 10) **Tape and Reel:** All dimensions and tolerances are specified acc. IEC 60286-3 and specified in mm.

Revision History

| Version | Date | Change |
|---------|------------|---------------------|
| 1.6 | 2019-10-24 | Dimensional Drawing |
| 1.7 | 2020-02-11 | Taping |

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