

LCW MTSG

Mini TOPLED®

Small size high-flux LED for slim designs



Applications

- Cluster, Button Backlighting
- Electronic Equipment
- Transportation, Plane, Ship
- White Goods

Features:

- Package: white SMT package, colored diffused silicone resin
- Chip technology: ThinGaN
- Typ. Radiation: 120° (Lambertian emitter)
- Color: Cx = 0.38, Cy = 0.38 acc. to CIE 1931 (● warm white)
- Corrosion Robustness Class: 3B
- Qualifications: AEC-Q102 Qualified
- Color temperature: 4000K
- CRI: 82
- ESD: 8 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 3B)

Ordering Information

Type	Color temperature	Luminous Intensity ¹⁾ $I_F = 10 \text{ mA}$ I_v	Ordering Code
LCW MTSG-U2V2-4L8N	4000 K	560 ... 1120 mcd	Q65111A2101

Maximum Ratings

Parameter	Symbol		Values
Operating Temperature	T_{op}	min.	-40 °C
		max.	110 °C
Storage Temperature	T_{stg}	min.	-40 °C
		max.	110 °C
Junction Temperature	T_j	max.	125 °C
Forward Current $T_s = 25\text{ °C}$	I_F	min.	3 mA
		max.	30 mA
Surge Current $t \leq 10\text{ }\mu\text{s}$; $D = 0.005$; $T_s = 25\text{ °C}$	I_{FS}	max.	300 mA
ESD withstand voltage acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 3B)	V_{ESD}		8 kV
Reverse current ²⁾	I_R	max.	200 mA

Characteristics

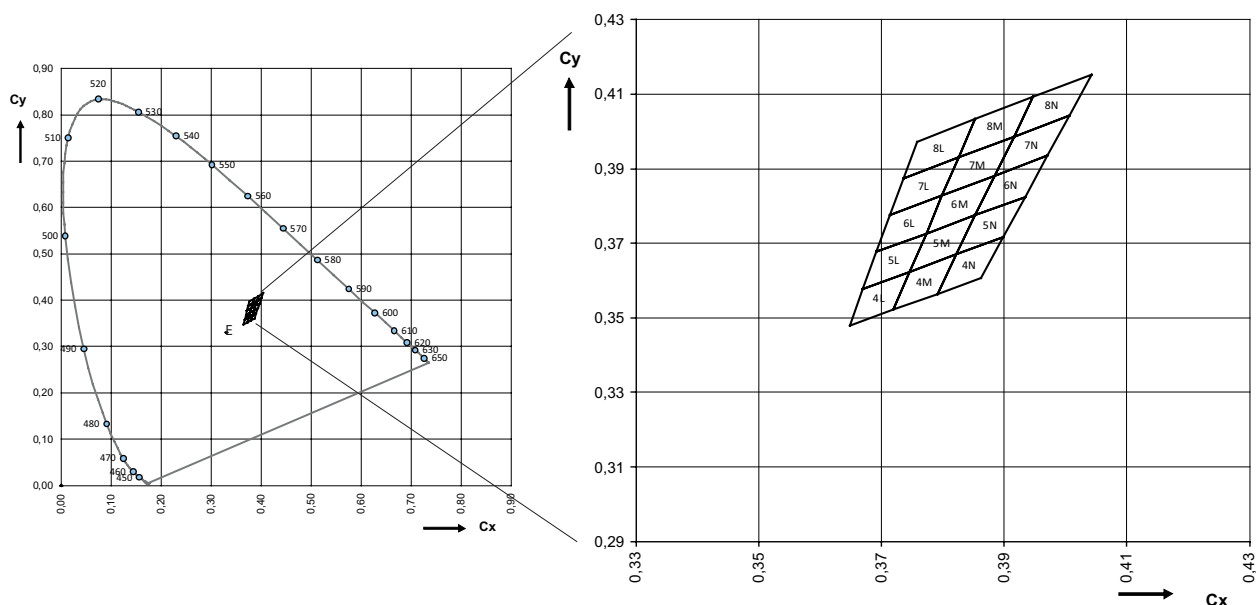
$I_F = 10 \text{ mA}$; $T_S = 25 \text{ °C}$

Parameter	Symbol		Values
Chromaticity Coordinate ³⁾	Cx	typ.	0.38
	Cy	typ.	0.38
Viewing angle at 50% I_V	2ϕ	typ.	120 °
Forward Voltage ⁴⁾ $I_F = 10 \text{ mA}$	V_F	min.	2.75 V
		typ.	3.00 V
		max.	3.45 V
Reverse voltage (ESD device)	$V_{R \text{ ESD}}$	min.	45 V
Reverse voltage ²⁾ $I_R = 20 \text{ mA}$	V_R	max.	1.2 V
Color Rendering Index	CRI	typ.	82
Real thermal resistance junction/ambient ⁵⁾⁶⁾	$R_{thJA \text{ real}}$	max.	360 K / W
Real thermal resistance junction/solderpoint ⁵⁾	$R_{thJS \text{ real}}$	max.	130 K / W

Brightness Groups

Group	Luminous Intensity ¹⁾ $I_F = 10 \text{ mA}$ min. I_v	Luminous Intensity ¹⁾ $I_F = 10 \text{ mA}$ max. I_v	Luminous Flux ⁷⁾ $I_F = 10 \text{ mA}$ typ. Φ_v
U2	560 mcd	710 mcd	1910 mlm
V1	710 mcd	900 mcd	2420 mlm
V2	900 mcd	1120 mcd	3030 mlm

Chromaticity Coordinate Groups ³⁾



Chromaticity Coordinate Groups ³⁾

Group	Cx	Cy	CCT	Group	Cx	Cy	CCT	Group	Cx	Cy	CCT
4L	0.3648	0.3479	4000	5M	0.3746	0.3624	4000	6N	0.3853	0.3776	4000
	0.3670	0.3578	4000		0.3773	0.3726	4000		0.3885	0.3882	4000
	0.3746	0.3624	4000		0.3853	0.3776	4000		0.3970	0.3935	4000
	0.3719	0.3522	4000		0.3822	0.3670	4000		0.3934	0.3825	4000
4M	0.3719	0.3522	4000	5N	0.3822	0.3670	4000	7L	0.3714	0.3775	4000
	0.3746	0.3624	4000		0.3853	0.3776	4000		0.3736	0.3874	4000
	0.3822	0.3670	4000		0.3934	0.3825	4000		0.3826	0.3931	4000
	0.3791	0.3564	4000		0.3898	0.3716	4000		0.3799	0.3828	4000
4N	0.3791	0.3564	4000	6L	0.3692	0.3677	4000	7M	0.3799	0.3828	4000
	0.3822	0.3670	4000		0.3714	0.3775	4000		0.3826	0.3931	4000
	0.3898	0.3716	4000		0.3799	0.3828	4000		0.3916	0.3987	4000
	0.3862	0.3607	4000		0.3773	0.3726	4000		0.3885	0.3882	4000
5L	0.3670	0.3578	4000	6M	0.3773	0.3726	4000	7N	0.3885	0.3882	4000
	0.3692	0.3677	4000		0.3799	0.3828	4000		0.3916	0.3987	4000
	0.3773	0.3726	4000		0.3885	0.3882	4000		0.4006	0.4044	4000
	0.3746	0.3624	4000		0.3853	0.3776	4000		0.3970	0.3935	4000

Discontinued

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Group	Cx	Cy	CCT	Group	Cx	Cy	CCT	Group	Cx	Cy	CCT
8L	0.3736	0.3874	4000	8M	0.3826	0.3931	4000	8N	0.3916	0.3987	4000
	0.3758	0.3973	4000		0.3853	0.4033	4000		0.3947	0.4093	4000
	0.3853	0.4033	4000		0.3947	0.4093	4000		0.4042	0.4153	4000
	0.3826	0.3931	4000		0.3916	0.3987	4000		0.4006	0.4044	4000

Discontinued

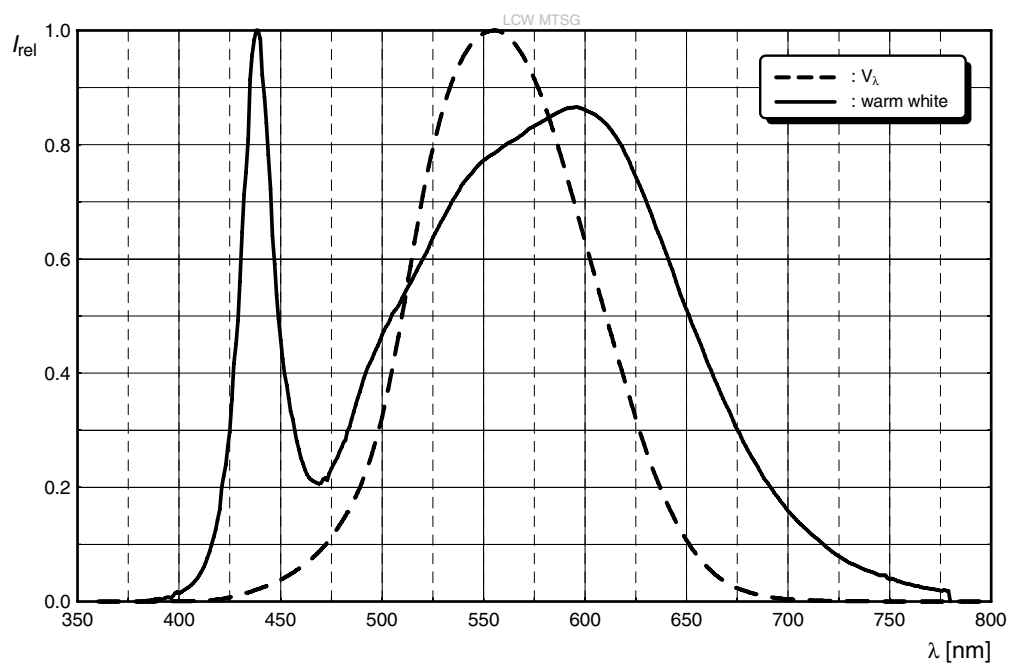
Group Name on Label

Example: U2-4L

Brightness	Color Chromaticity
U2	4L

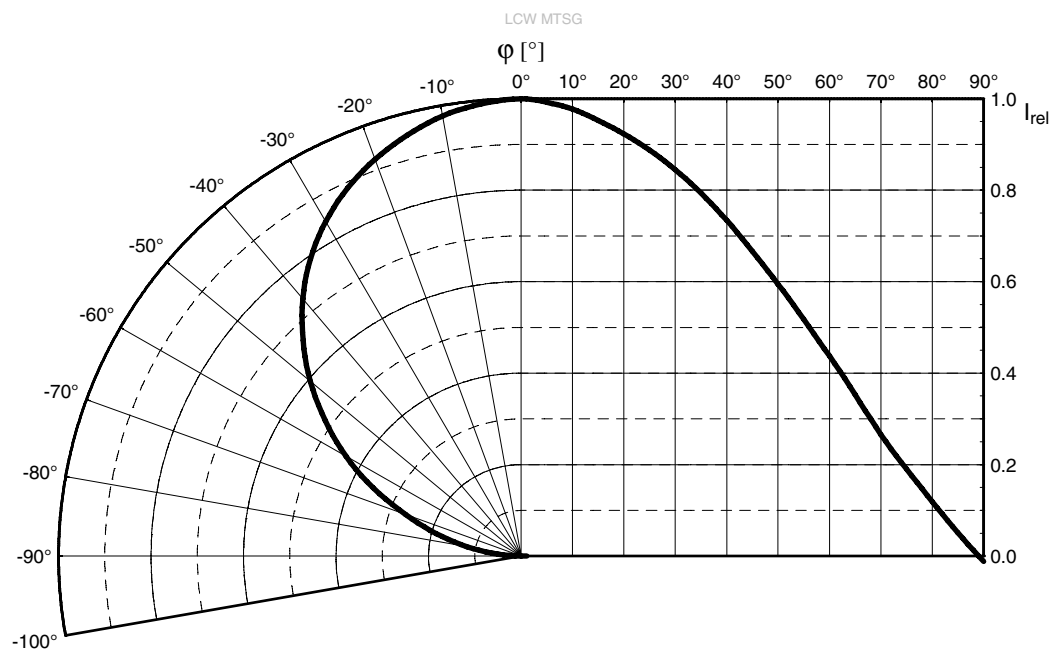
Relative Spectral Emission ⁷⁾

$$I_{\text{rel}} = f(\lambda); I_F = 10 \text{ mA}; T_S = 25 \text{ }^\circ\text{C}$$



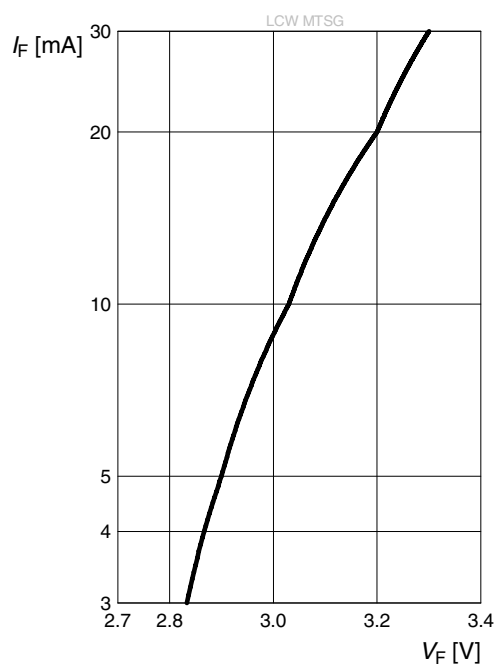
Radiation Characteristics ⁷⁾

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



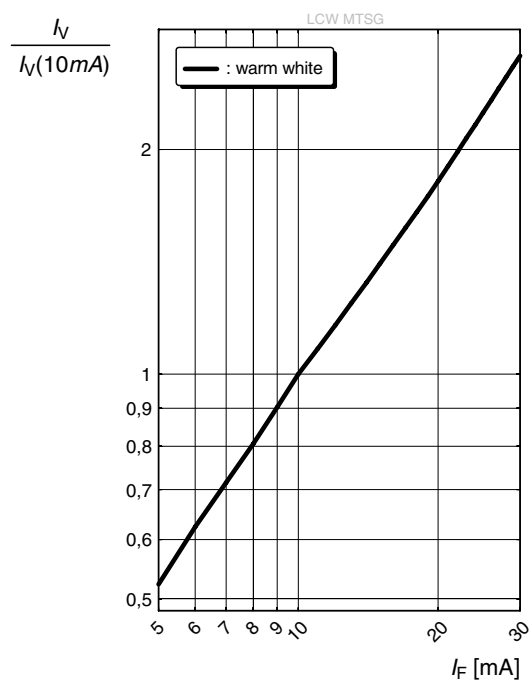
Forward current ⁷⁾

$$I_F = f(V_F); T_S = 25\text{ °C}$$



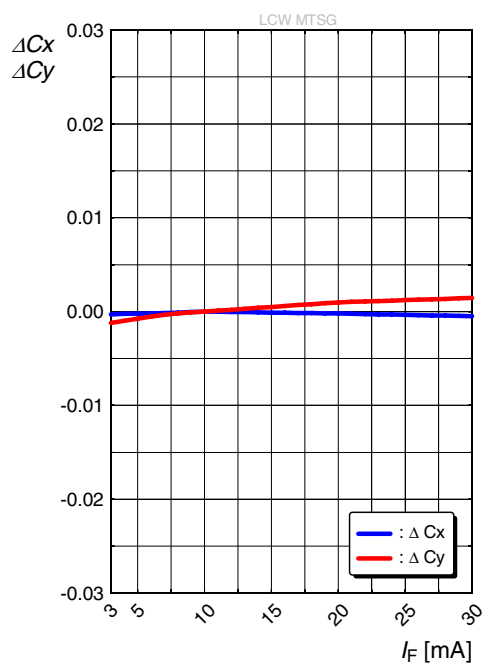
Relative Luminous Intensity ^{7), 8)}

$$I_V/I_V(10\text{ mA}) = f(I_F); T_S = 25\text{ °C}$$



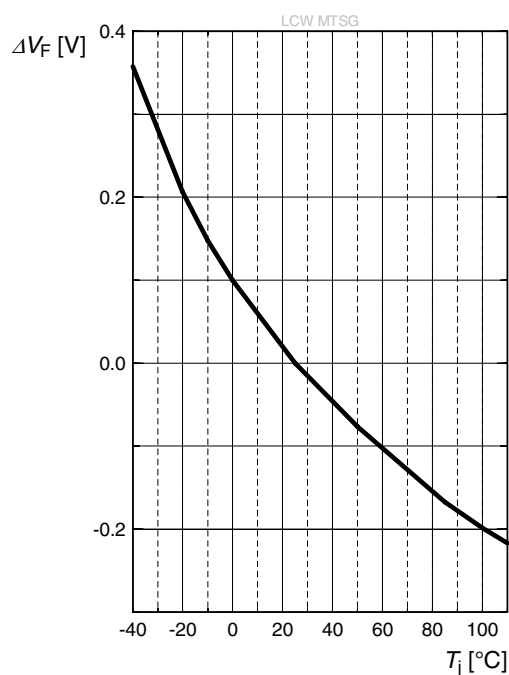
Chromaticity Coordinate Shift ⁷⁾

$$\Delta Cx, \Delta Cy = f(I_F); T_S = 25\text{ °C}$$

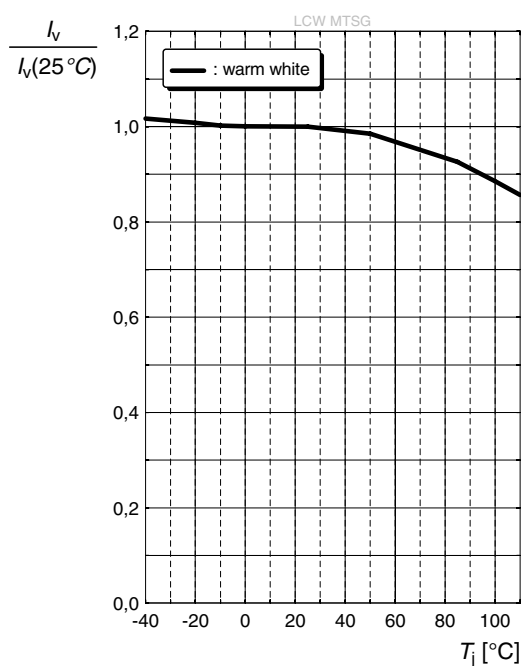


Forward Voltage ⁷⁾

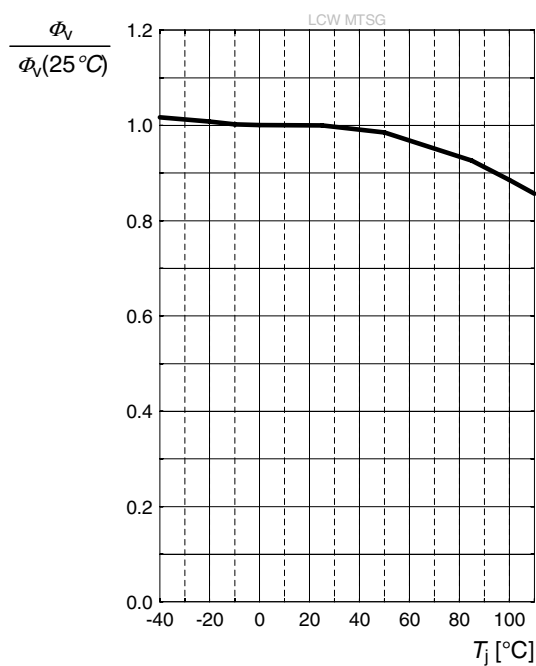
$$\Delta V_F = V_F - V_F(25^\circ\text{C}) = f(T_j); I_F = 10\text{ mA}$$

**Relative Luminous Intensity** ⁷⁾

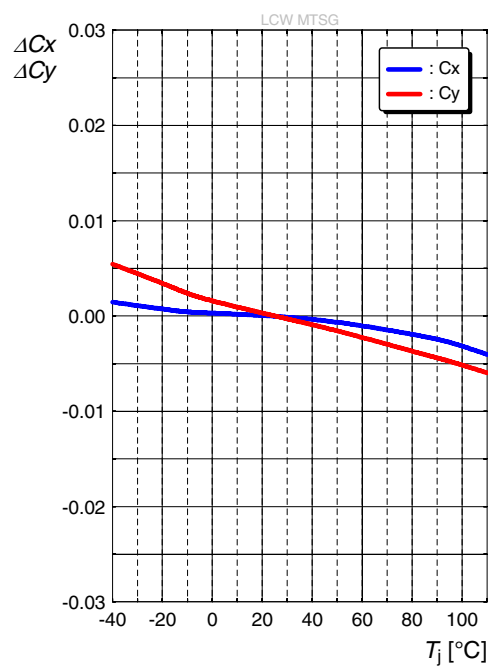
$$I_V/I_V(25^\circ\text{C}) = f(T_j); I_F = 10\text{ mA}$$

**Relative Luminous Flux** ⁷⁾

$$I_V/I_V(25^\circ\text{C}) = f(T_j); I_F = 10\text{ mA}$$

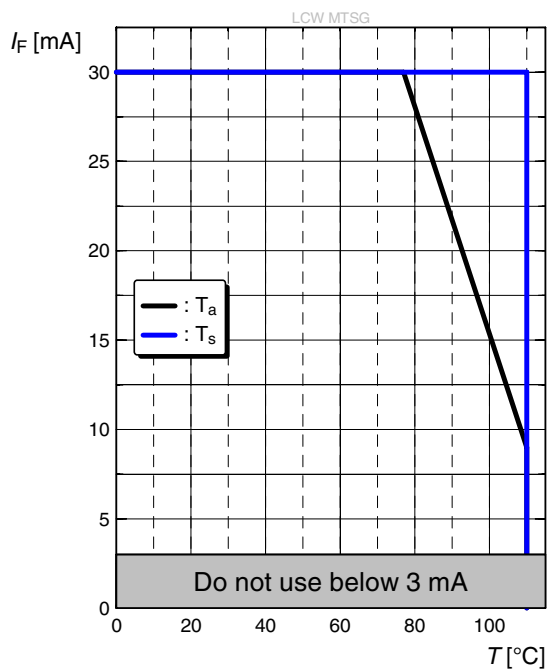
**Chromaticity Coordinate Shift** ⁷⁾

$$\Delta C_x, \Delta C_y = f(T_j); I_F = 10\text{ mA}$$



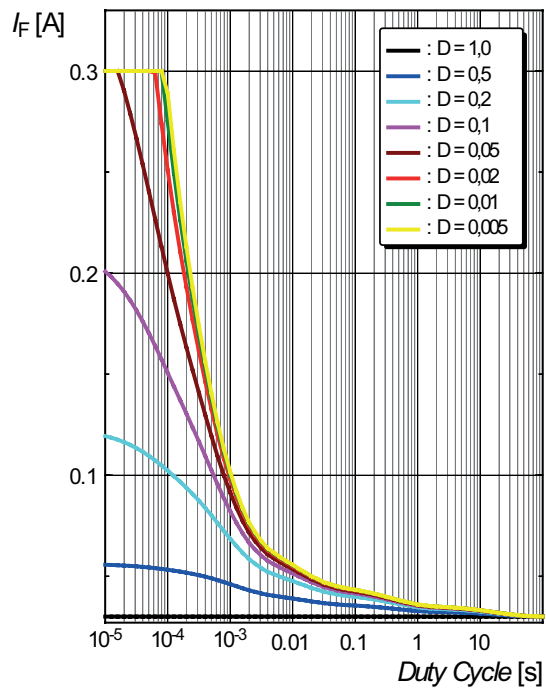
Max. Permissible Forward Current

$$I_F = f(T)$$



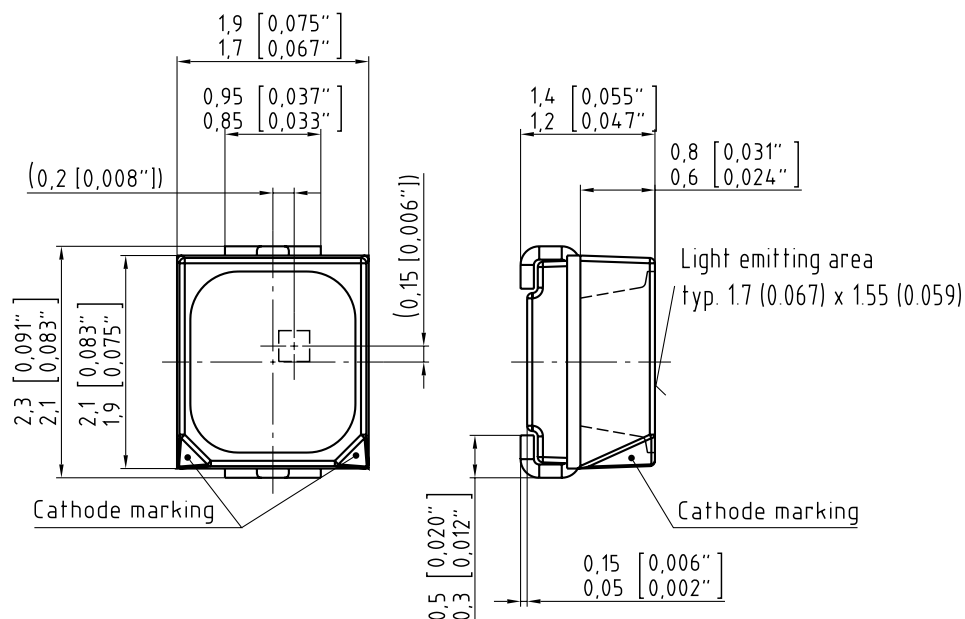
Permissible Pulse Handling Capability

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



Discontinued

Dimensional Drawing ⁹⁾



C63062-A4112-A1.-06

Further Information:

Approximate Weight: 9.0 mg

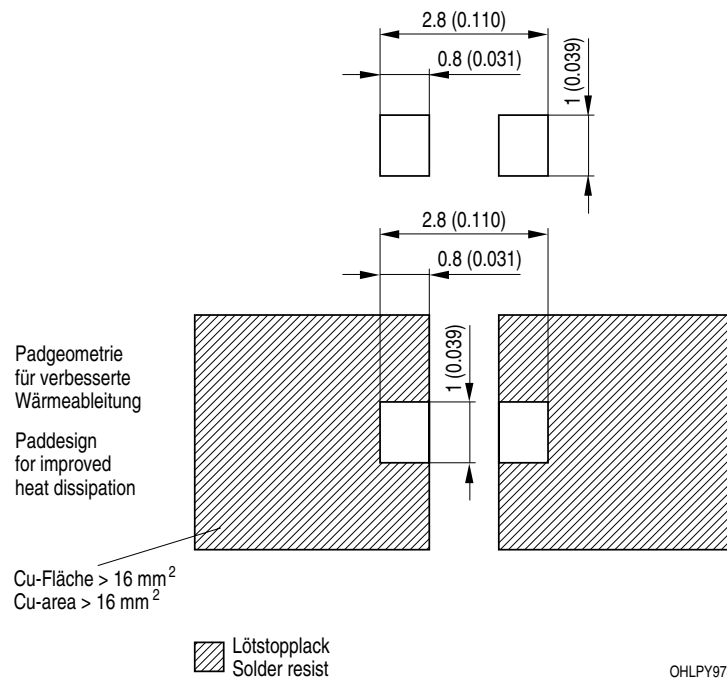
Package marking: Cathode

Corrosion test: Class: 3B

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

ESD advice: The device is protected by ESD device which is connected in parallel to the Chip.

Recommended Solder Pad ⁹⁾



For superior solder joint connectivity results we recommend soldering under standard nitrogen atmosphere.

Reflow Soldering Profile

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

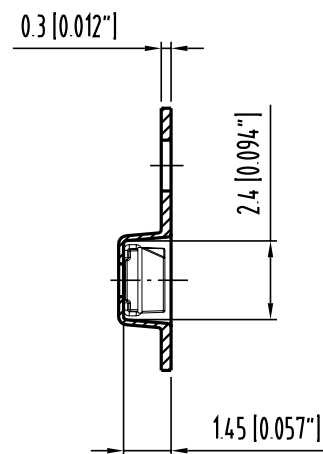
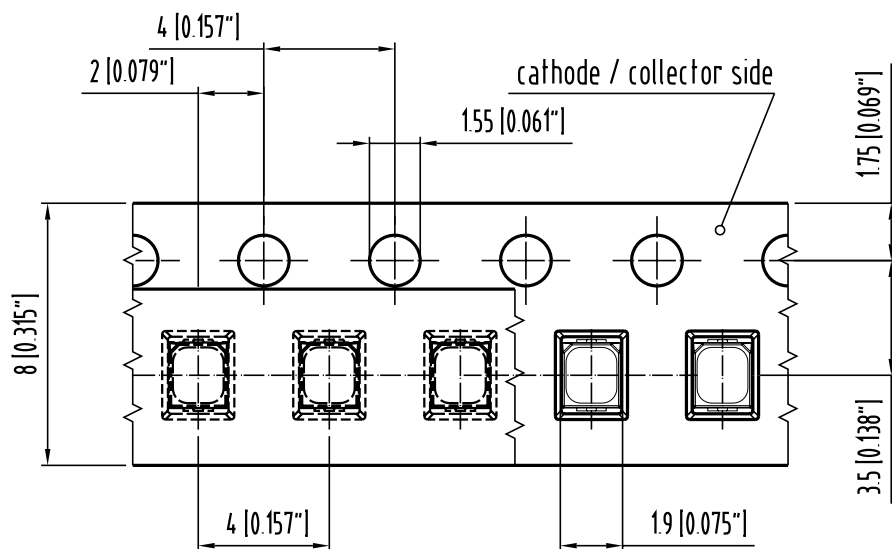


Profile Feature	Symbol	Pb-Free (SnAgCu) Assembly			Unit
		Minimum	Recommendation	Maximum	
Ramp-up rate to preheat ^{*)} 25°C to 150°C			2	3	K/s
Time t_s T_{Smin} to T_{Smax}	t_s	60	100	120	s
Ramp-up rate to peak ^{*)} T_{Smax} to T_p			2	3	K/s
Liquidus temperature	T_L		217		$^{\circ}\text{C}$
Time above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

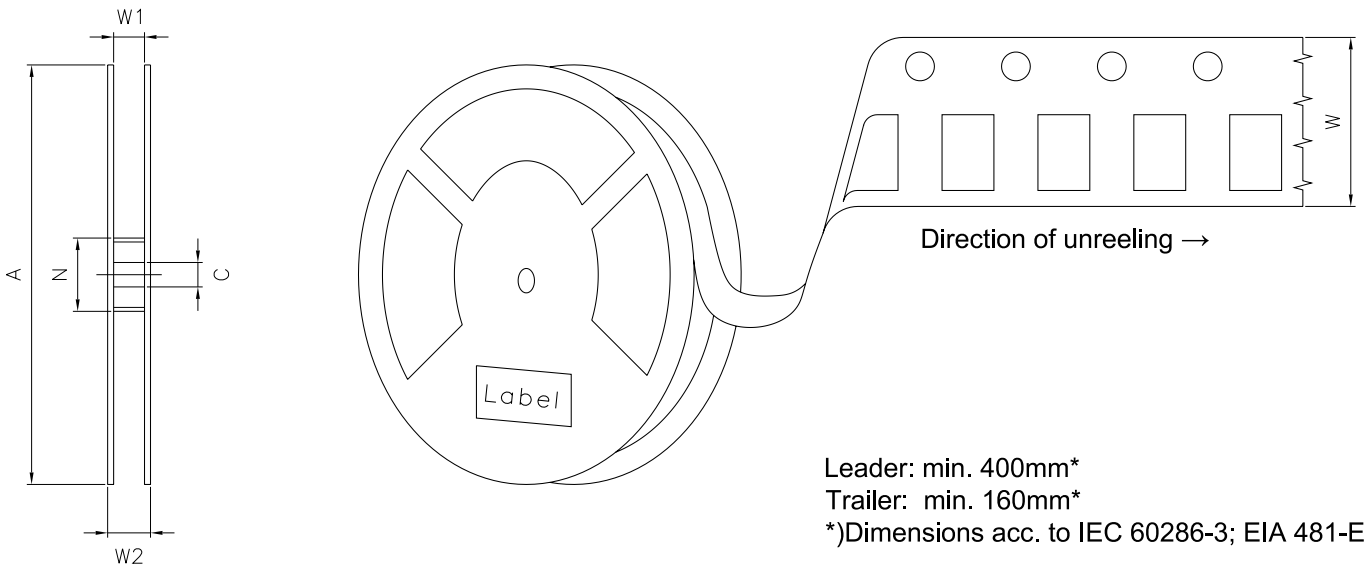
* slope calculation DT/Dt : Dt max. 5 s; fulfillment for the whole T-range

Taping ⁹⁾



C63062-A4112-B3 -02

Tape and Reel ¹⁰⁾



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	3000

Barcode-Product-Label (BPL)

OSRAM Opto Semiconductors

LX XXXX
BIN1: XX-XX-X-XXX-X

(6P) BATCH NO: 1234567890
RoHS Compliant

ML Temp ST
X XXX °C X

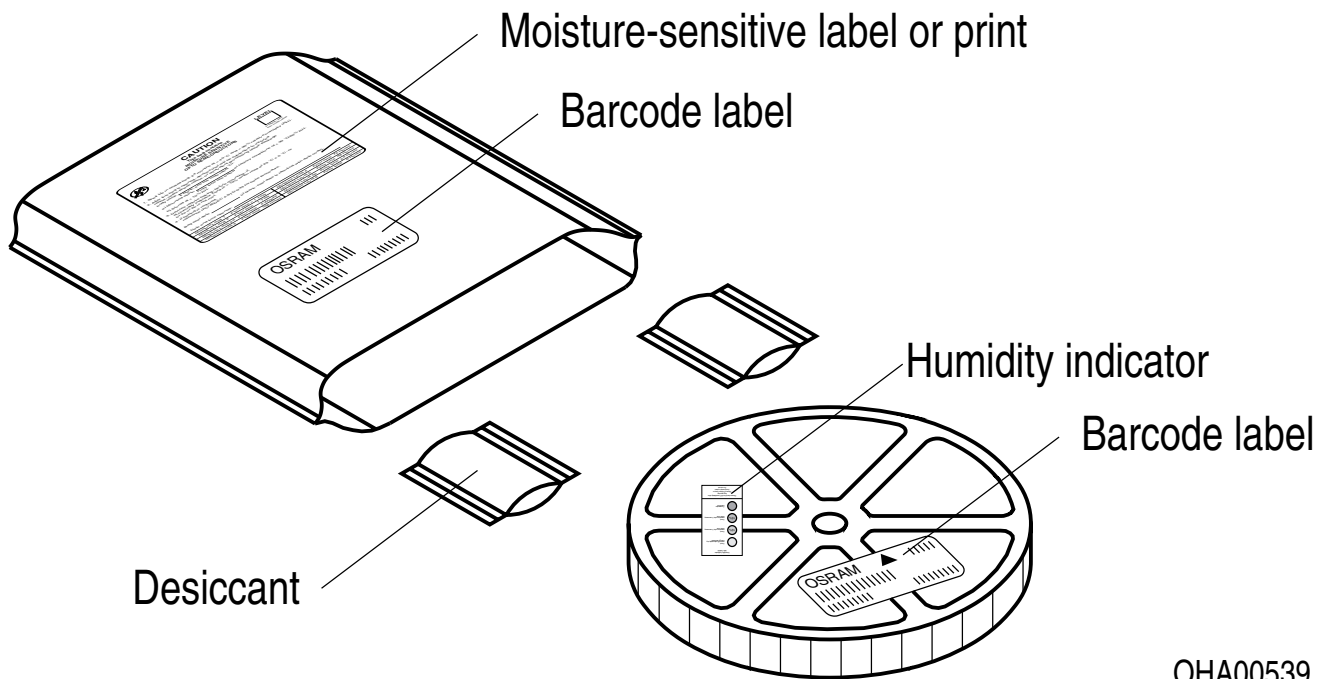
(1T) LOT NO: 1234567890
(9D) D/C: 1234

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 ⁹⁾



OHA00539

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

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.

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 values are measured during a current pulse of typically 25 ms, with an internal reproducibility of $\pm 8\%$ and an expanded uncertainty of $\pm 11\%$ (acc. to GUM with a coverage factor of $k = 3$).
- 2) **Reverse Operation:** This product is intended to be operated applying a forward current within the specified range. Applying any continuous reverse bias or forward bias below the voltage range of light emission shall be avoided because it may cause migration which can change the electro-optical characteristics or damage the LED.
- 3) **Chromaticity coordinate groups:** Chromaticity coordinates are measured during a current pulse of typically 25 ms, with an internal reproducibility of ± 0.005 and an expanded uncertainty of ± 0.01 (acc. to GUM with a coverage factor of $k = 3$).
- 4) **Forward Voltage:** The forward voltage is measured during a current pulse of typically 8 ms, with an internal reproducibility of $\pm 0.05\text{ V}$ and an expanded uncertainty of $\pm 0.1\text{ V}$ (acc. to GUM with a coverage factor of $k = 3$).
- 5) **Thermal Resistance:** $R_{th\text{ max}}$ is based on statistic values (6σ).
- 6) **Thermal Resistance:** R_{thJA} results from mounting on PC board FR 4 (pad size 16 mm^2 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
1.2	2020-11-02	Discontinued

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EU RoHS and China RoHS compliant product



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