OSRAM LE BR Q7WM

Datasheet

Discontinued

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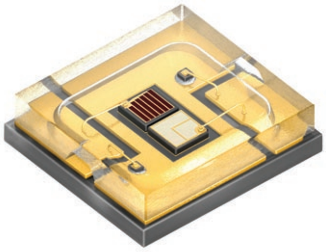
OSRAM OSTAR® Projection Compact

LE BR Q7WM

Compact light source in SMT technology, glass window on top,
RoHS compliant



Applications

- Projection & Display
- Visualization

Features

- Package: compact lightsource in SMT technology with glass window on top
- Chip technology: Thinfilm / ThinGaN
- Typ. Radiation: 120° (Lambertian emitter)
- Color: λ_{dom} = 460 nm (● blue); λ_{dom} = 617 nm (● red)
- Corrosion Robustness Class: 3B
- ESD: 2 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM)

Ordering Information

Type	Brightness [1]	Ordering Code
LE BR Q7WM-TGTI-24+JXJZ-23		Q65112A7832
● blue	● Φ_E = 280 ... 450 mW (I_F = 350 mA)	
● red	● Φ_V = 45 ... 71 lm (I_F = 350 mA)	

Ordering Information

Type	Brightness [1]	Ordering Code

Maximum Ratings

Parameter	Symbol		Values ● blue	Values ● red
Operating Temperature	T_{op}	min. max.	-40 °C 85 °C	-40 °C 85 °C
Storage Temperature	T_{stg}	min. max.	-40 °C 85 °C	-40 °C 85 °C
Junction Temperature	T_j	max.	125 °C	125 °C
Forward Current $T_j = T_{j\ max.}$	I_F	min. max.	20 mA 500 mA	20 mA 500 mA
Forward Current pulsed $f = 240Hz; D = 0.5 ; T_j = T_{jmax}$	$I_{F\ pulse}$		1000 mA	1000 mA
Surge Current $t \leq 10\mu s; D = 0.5; T_j = T_{j\ max.}$	I_{FS}	max.	1500 mA	1500 mA
ESD withstand voltage acc. to ANSI/ESDA/JEDEC JS-001 (HBM)	V_{ESD}		2 kV	2 kV
Reverse current [2)]	I_R	max.	200 mA	200 mA

Characteristics

I_F = 350 mA; T_S = 25 °C

Parameter	Symbol		Values ● blue	Values ● red
Peak Wavelength	λ_{peak}	typ.	460 nm	624 nm
Dominant Wavelength [3]	λ_{dom}	min. typ. max.	450 nm 460 nm 465 nm	610 nm 617 nm 622 nm
Spectral bandwidth at 50% $I_{rel,max}$	$\Delta\lambda$	typ.	19 nm	18 nm
Viewing angle at 50% I_V	2φ	typ.	120 °	120 °
Radiating surface	A_{color}	typ.	0.65 x 0.65 mm²	0.65 x 0.65 mm²
Partial Flux acc. CIE 127:2007 [4] $\Phi_{E/V\ 120°} = x * \Phi_{E/V\ 180°}$	$\Phi_{E/V,\ 120°}$	typ.	0.82	0.82
Forward Voltage [5] I_F = 350 mA	V_F	min. typ. max.	2.70 V 3.40 V 3.70 V	2.00 V 2.30 V 2.70 V
Reverse voltage (ESD device)	$V_{R\ ESD}$	min.	5 V	5 V
Reverse voltage [2] I_R = 20 mA	V_R	max.	1.2 V	1.2 V
Real thermal resistance junction/solderpoint [6] 1 Chip on	$R_{thJS\ real}$	typ. max.	16 K / W 19 K / W	14 K / W 17 K / W
Electrical thermal resistance junction/solderpoint [6] 1 Chip on with efficiency ηe = 29 % (blue); 27 % (red)	$R_{thJS\ elec.}$	typ. max.	11 K / W 13 K / W	10 K / W 12 K / W

Brightness Groups

● blue

Group	Radiant Flux [1] I_F = 350 mA min. Φ_E	Radiant Flux [1] I_F = 350 mA max. Φ_E
TG	280 mW	330 mW
TH	330 mW	390 mW
TI	390 mW	450 mW

Brightness Groups

● red

Group	Luminous Flux [1] I_F = 350 mA min. Φ_V	Luminous Flux [1] I_F = 350 mA max. Φ_V
JX	45 lm	52 lm
JY	52 lm	61 lm
JZ	61 lm	71 lm

Wavelength Groups

● blue

Group	Dominant Wavelength 3) min. λ_{dom}	Dominant Wavelength 3) max. λ_{dom}
2	450 nm	455 nm
3	455 nm	460 nm
4	460 nm	465 nm

Wavelength Groups

● red

Group	Dominant Wavelength 3) min. λ_{dom}	Dominant Wavelength 3) max. λ_{dom}
2	610 nm	616 nm
3	616 nm	622 nm

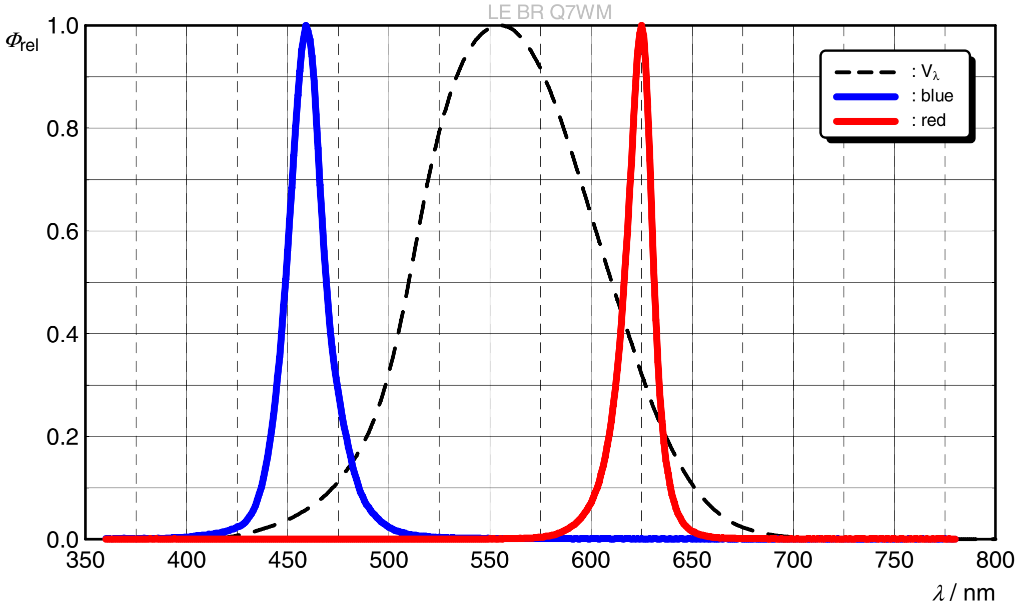
Group Name on Label

Example: TG-2+JX-2

Color	Brightness	Wavelength
● blue	TG	2
● red	JX	2

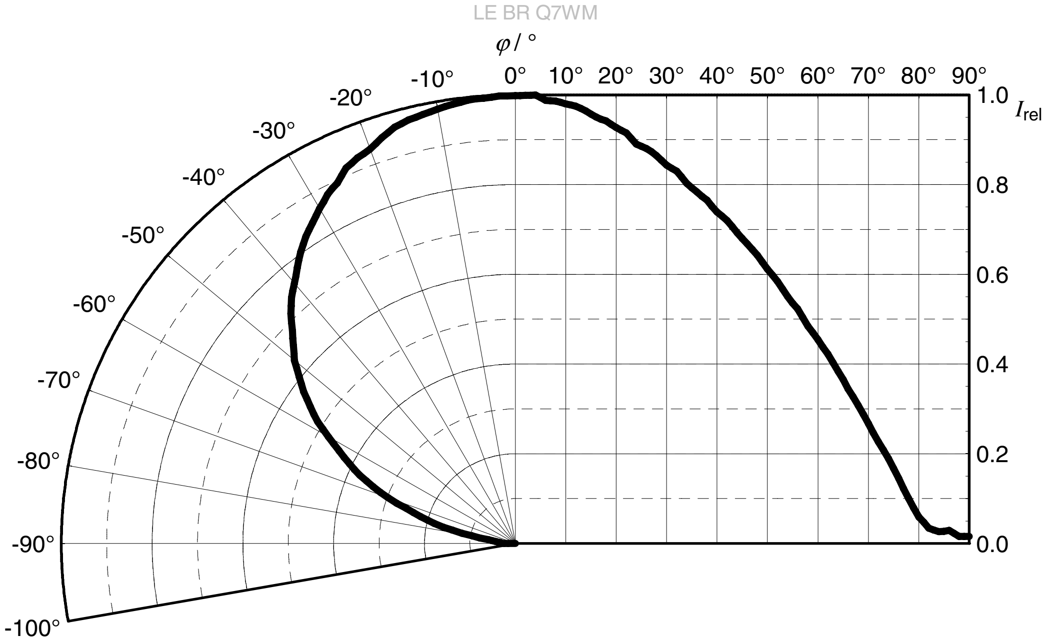
Relative Spectral Emission [4)]

$\Phi_{rel} = f(\lambda)$; $I_F = 350$ mA; $T_J = 25$ °C



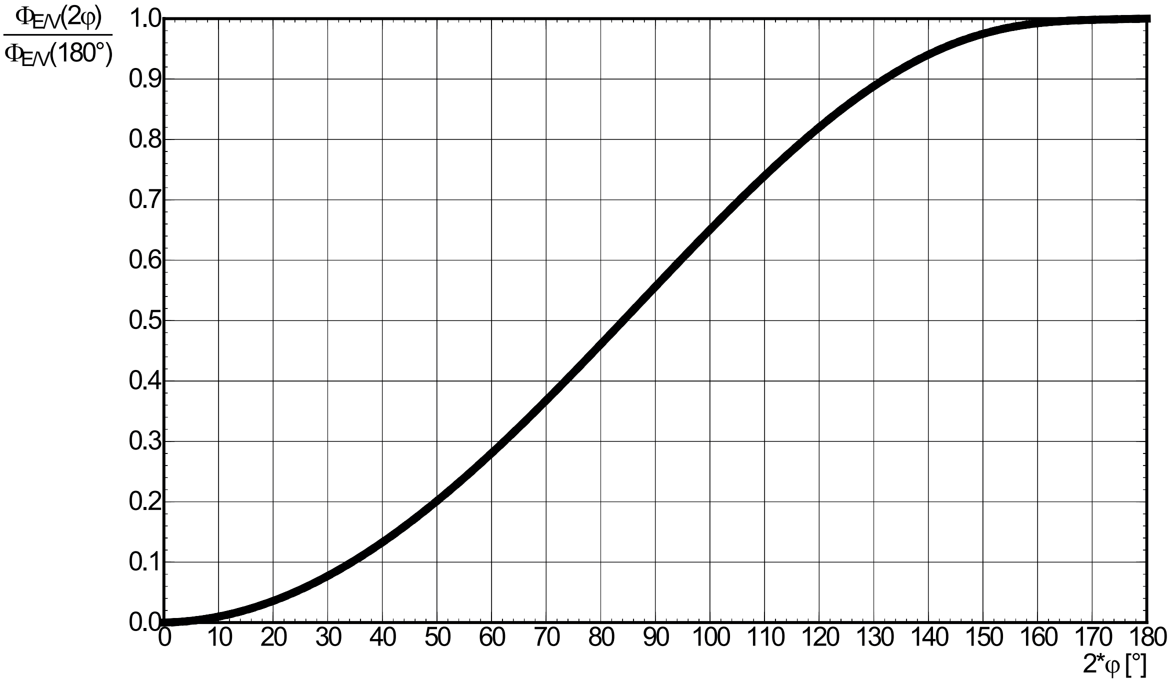
Radiation Characteristics [4)]

$I_{rel} = f(\phi)$; $T_J = 25$ °C



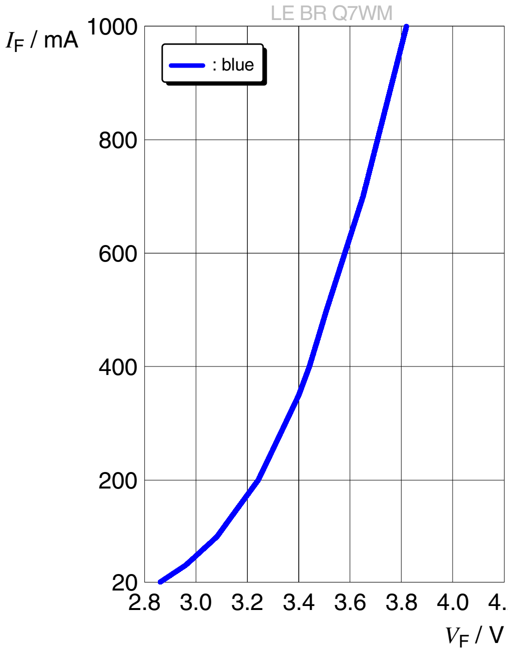
Relative Partial Flux [4)]

$\Phi_{V/E}(2\varphi)/\Phi_{V/E}(180°) = f(\varphi)$; T_J = 25 °C



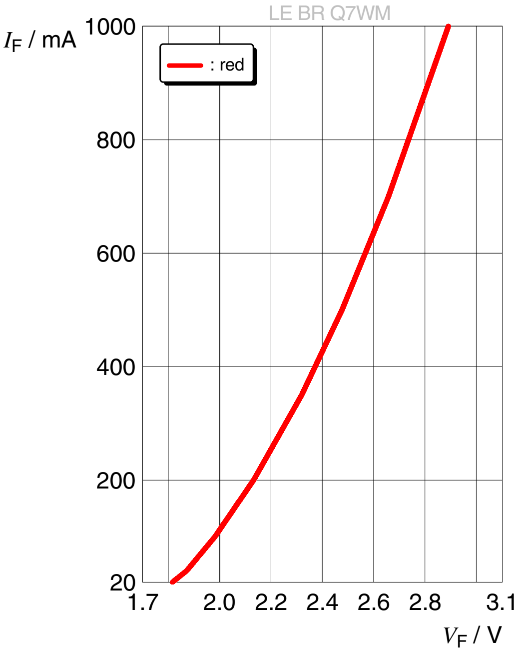
Forward current [4), 7)]

$I_F = f(V_F)$; T_J = 25 °C



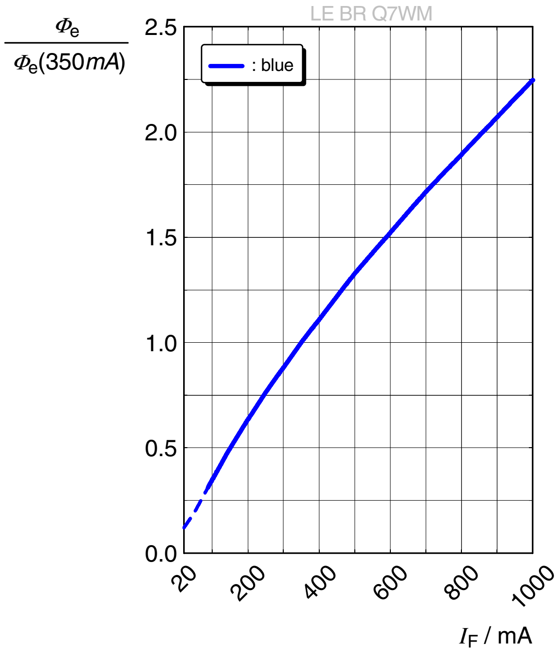
Forward current [4), 7)]

$I_F = f(V_F)$; T_J = 25 °C



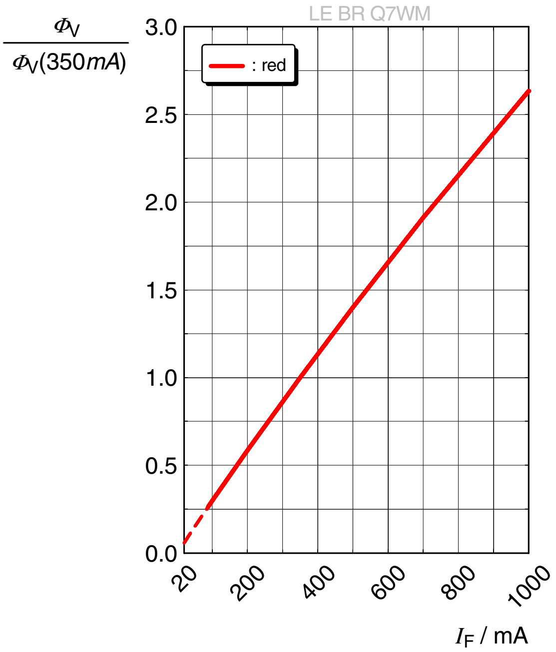
Relative Radiant Power [4), 7)]

$\Phi_E/\Phi_E(350\text{ mA}) = f(I_F)$; T_J = 25 °C



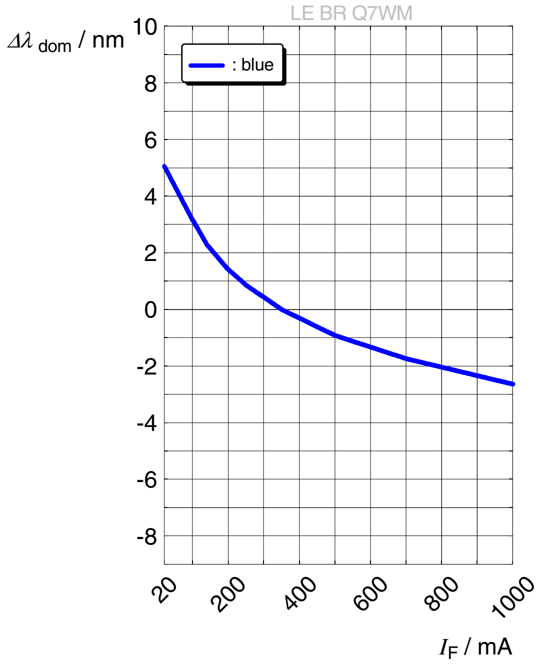
Relative Luminous Flux [4), 7)]

$\Phi_V/\Phi_V(350\text{ mA}) = f(I_F)$; T_J = 25 °C



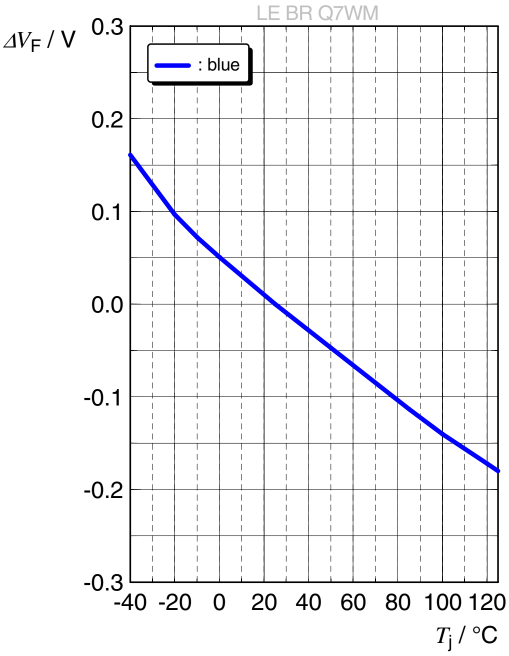
Dominant Wavelength [4)]

$\Delta\lambda_{dom} = f(I_F)$; T_J = 25 °C



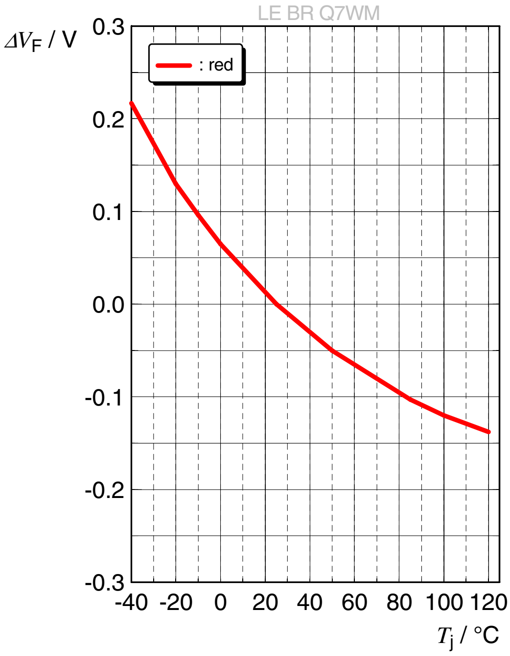
Forward Voltage [4)]

$\Delta V_F = V_F - V_F(25\ °C) = f(T_j);\ I_F = 350\ mA$



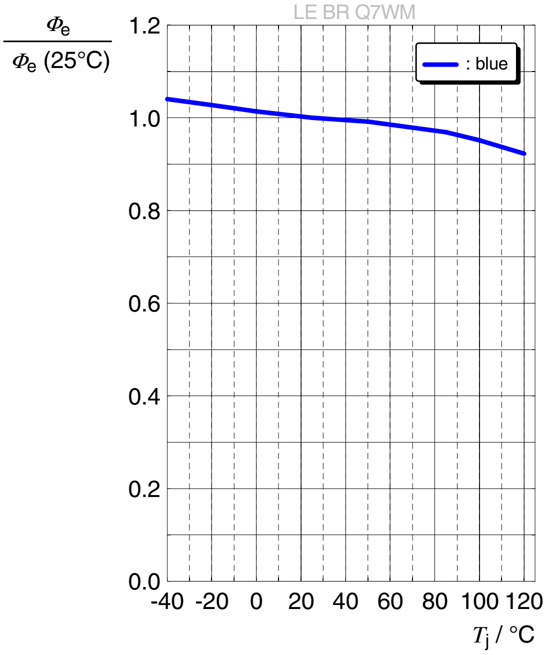
Forward Voltage [4)]

$\Delta V_F = V_F - V_F(25\ °C) = f(T_j);\ I_F = 350\ mA$



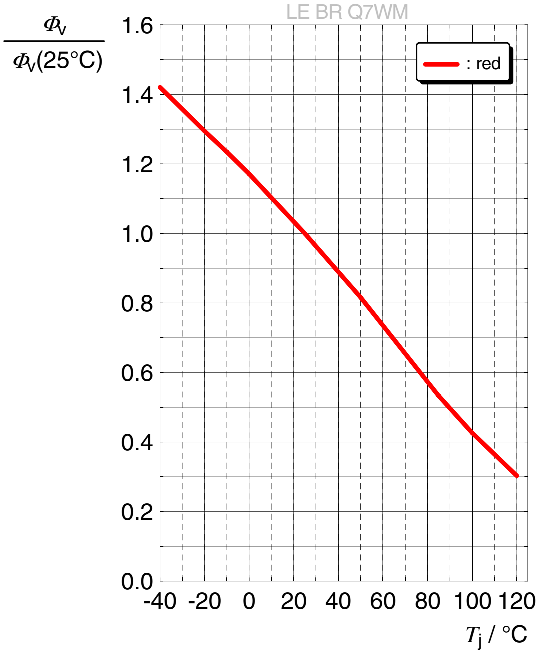
Relative Radiant Power [4)]

$\Phi_E/\Phi_E(25\ °C) = f(T_j);\ I_F = 350\ mA$



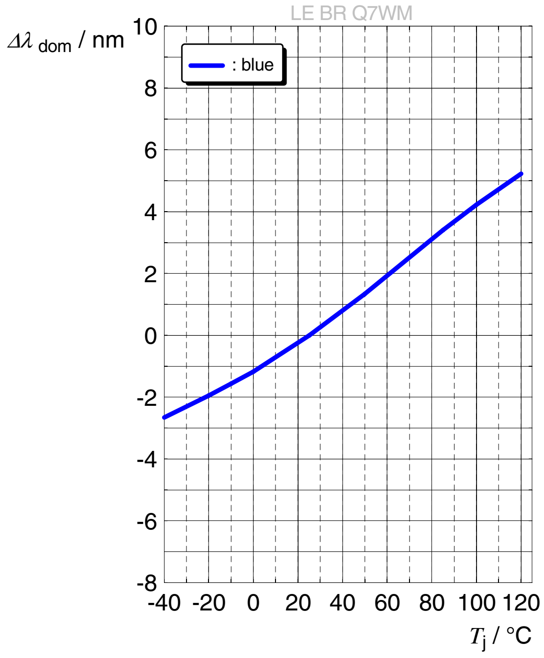
Relative Luminous Flux [4)]

$\Phi_V/\Phi_V(25\ °C) = f(T_j);\ I_F = 350\ mA$



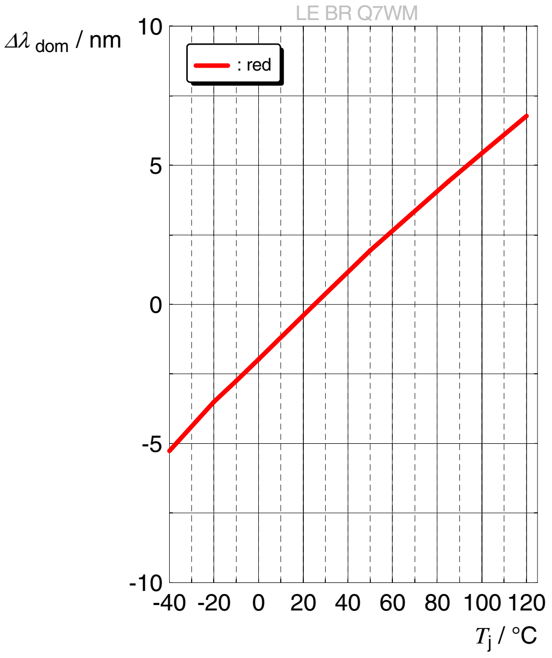
Dominant Wavelength [4]

$\Delta\lambda_{dom} = \lambda_{dom} - \lambda_{dom}(25\ °C) = f(T_j);\ I_F = 350\ mA$

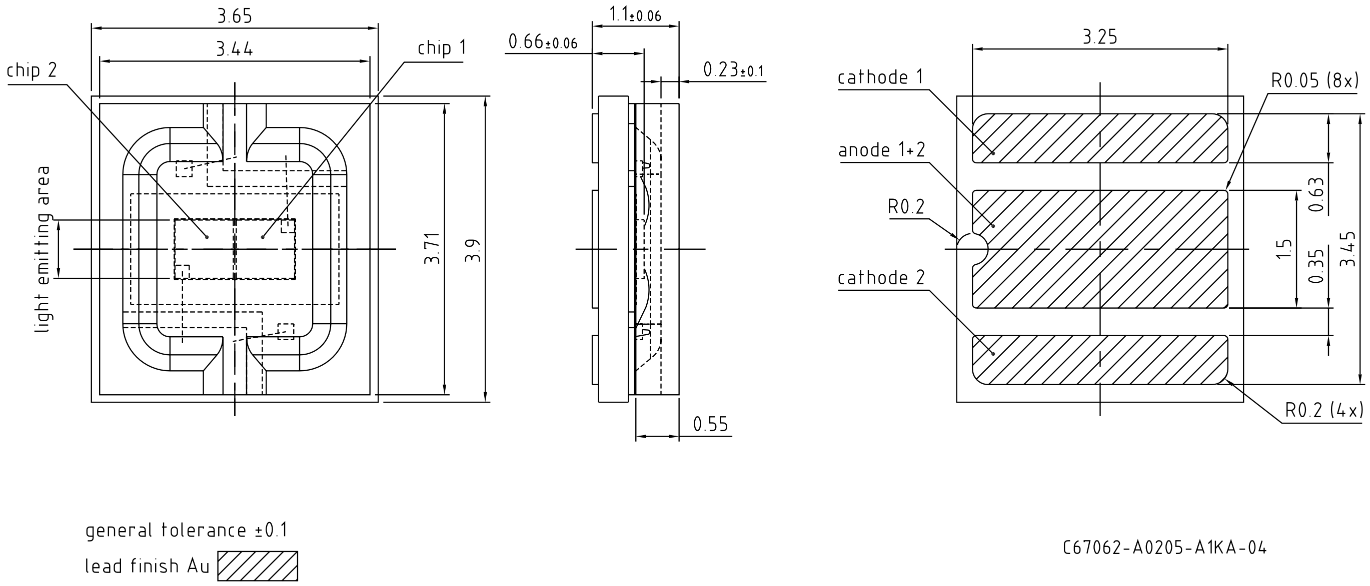


Dominant Wavelength [4]

$\Delta\lambda_{dom} = \lambda_{dom} - \lambda_{dom}(25\ °C) = f(T_j);\ I_F = 350\ mA$



Dimensional Drawing [8]



Further Information:

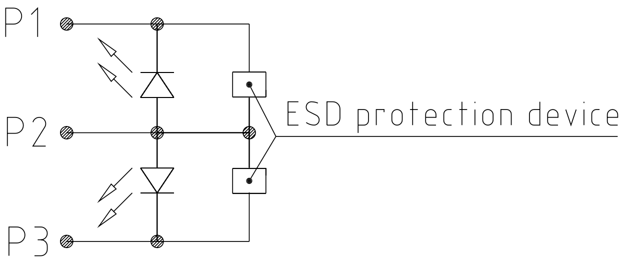
Approximate Weight:	46.0 mg
Corrosion test:	Class: 3B Test condition: 40°C / 90 % RH / 15 ppm H_2S / 14 days (stricter than IEC 60068-2-43)
ESD advice:	The device is protected by ESD device which is connected in parallel to the Chip.

Electrical Internal Circuit

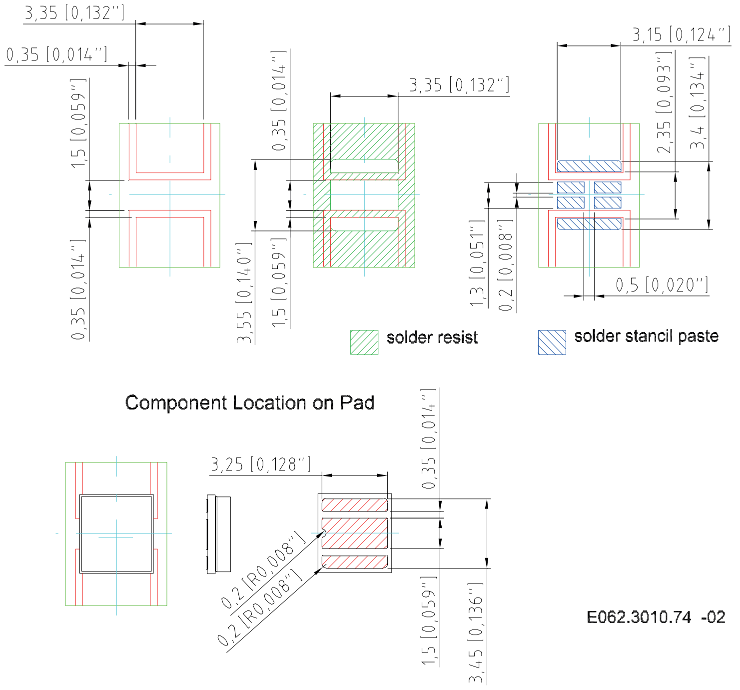
Pin Assignment:
P1 : cathode chip 1
P2 : anode chip 1 + chip 2
P3 : cathode chip 2

Chip 1 : Blue
Chip 2 : Red

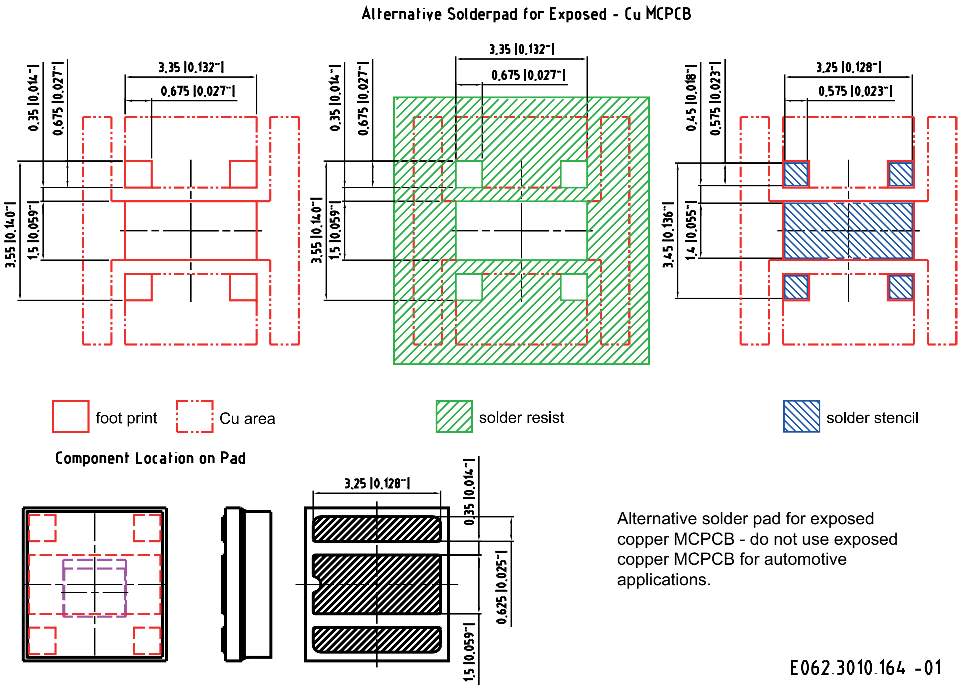
Electrical Internal Circuit and Pin Assignment



Recommended Solder Pad [8)]



Recommended Solder Pad [8)]

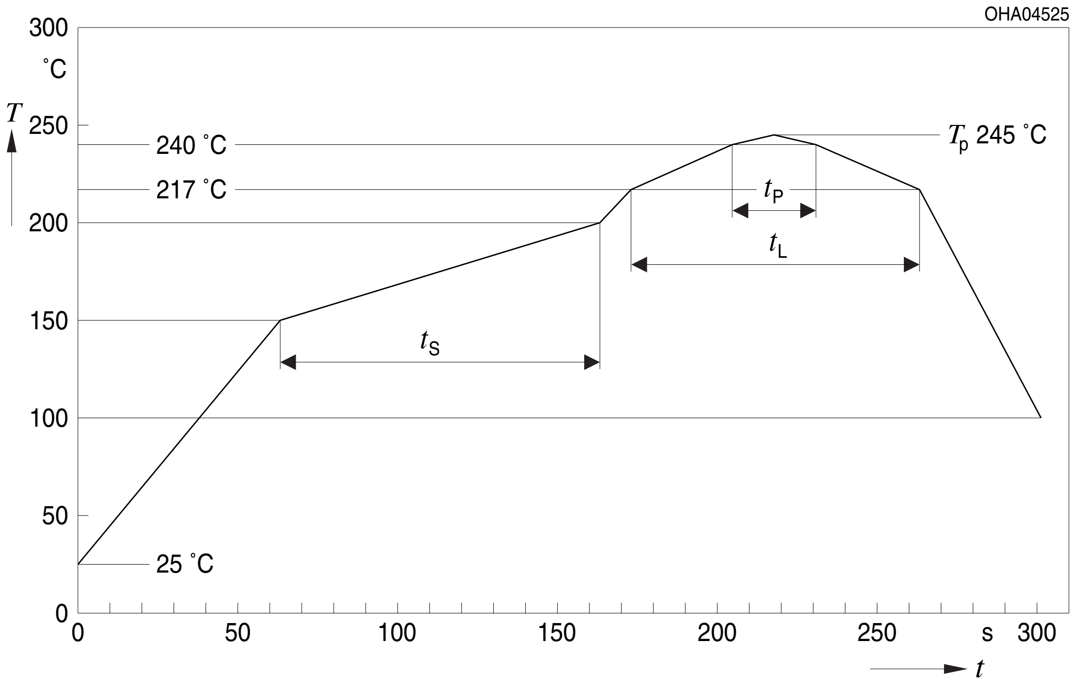


Alternative solder pad for exposed copper MCPCB - do not use exposed copper MCPCB for automotive applications.

Exposed Copper MCPCB must not exceed thickness of 1mm. For superior solder joint connectivity results we recommend soldering under standard nitrogen atmosphere. Package not suitable for any kind of wet cleaning or ultrasonic cleaning. In any case the solder pad design shall be validated under customer application conditions.

Reflow Soldering Profile

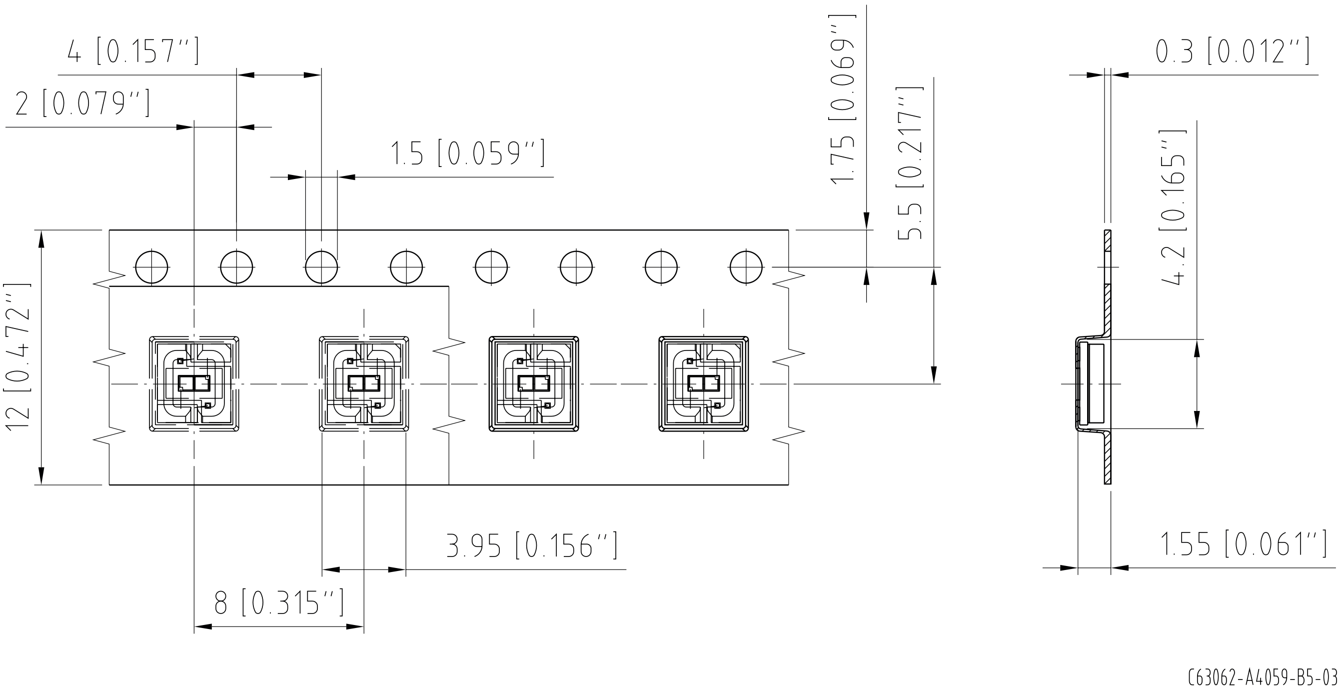
Product complies to MSL Level 2 acc. to JEDEC J-STD-020E



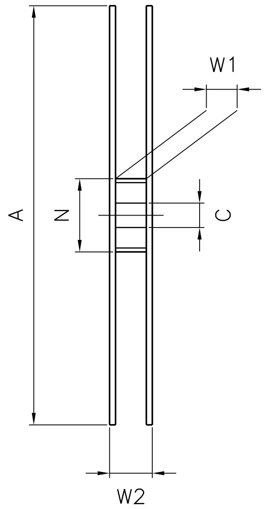
Profile Feature	Symbol	Pb-Free (SnAgCu) Assembly			Unit
		Minimum	Recommendation	Maximum	
Ramp-up rate to preheat*) 25 °C to 150 °C			2	3	K/s
Time t_S T_{Smin} to T_{Smax}	t_S	60	100	120	s
Ramp-up rate to peak*) T_{Smax} to T_P			2	3	K/s
Liquidus temperature	T_L		217		°C
Time above liquidus temperature	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

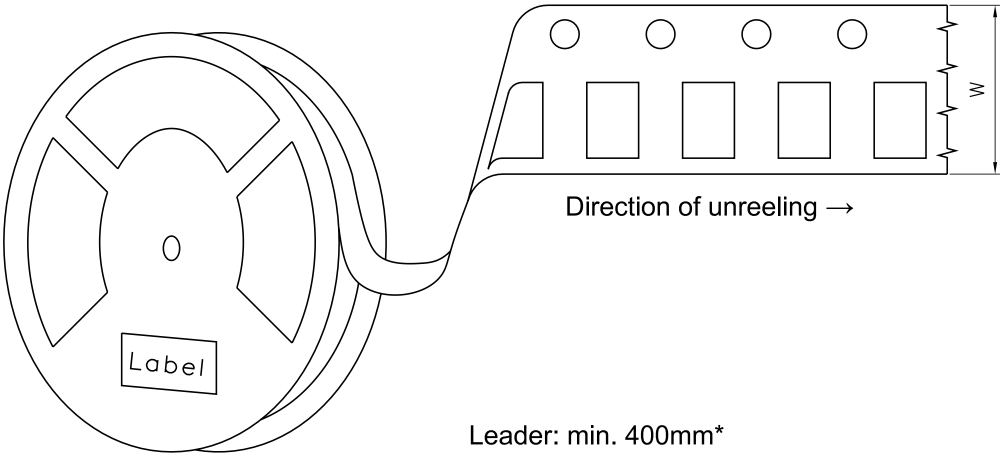
All temperatures refer to the center of the package, measured on the top of the component
* slope calculation DT/Dt: Dt max. 5 s; fulfillment for the whole T-range

Taping [8]


4 [0.157"]
2 [0.079"]
1.5 [0.059"]
1.75 [0.069"]
5.5 [0.217"]
12 [0.472"]
3.95 [0.156"]
8 [0.315"]
0.3 [0.012"]
4.2 [0.165"]
1.55 [0.061"]
C63062-A4059-B5-03

Tape and Reel [9)]



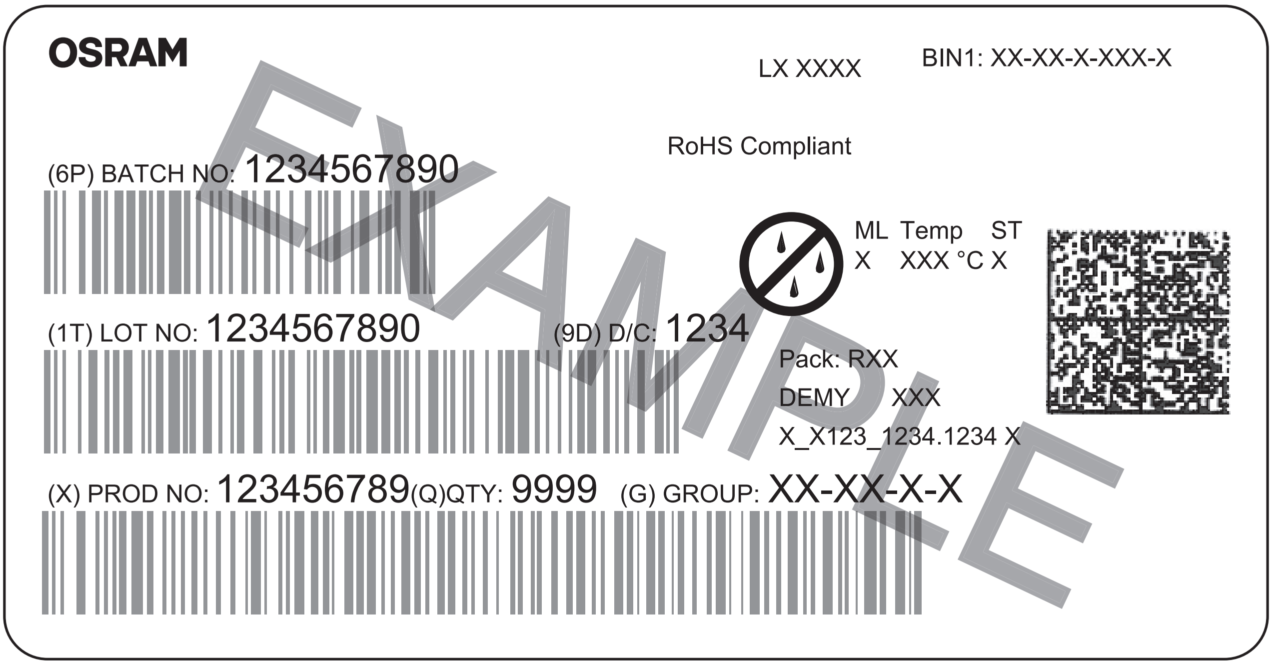


Leader: min. 400mm*
Trailer: min. 160mm*
*)Dimensions acc. to IEC 60286-3; EIA 481-E

Reel Dimensions

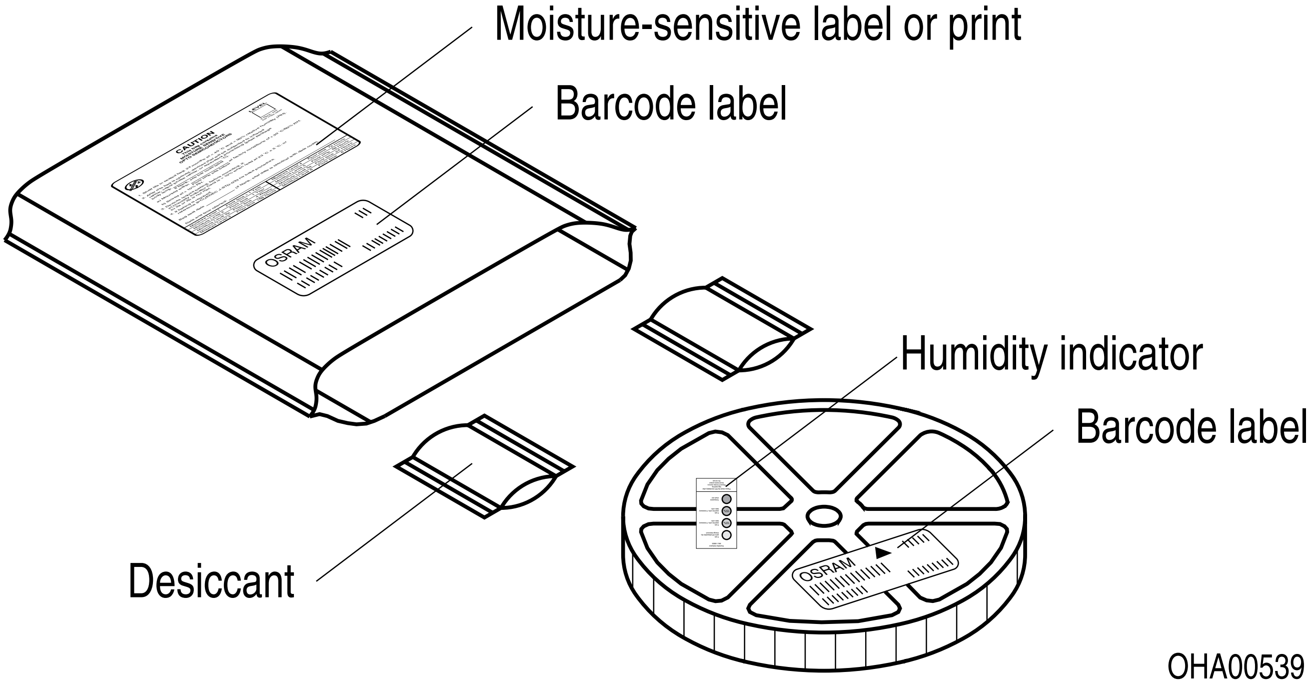
A	W	N_{min}	W_1	$W_{2\,max}$	Pieces per PU
180 mm	12 + 0.3 / - 0.1 mm	60 mm	12.4 + 2 mm	18.4 mm	500

Barcode-Product-Label (BPL)



OHA04563

Dry Packing Process and Materials [8]



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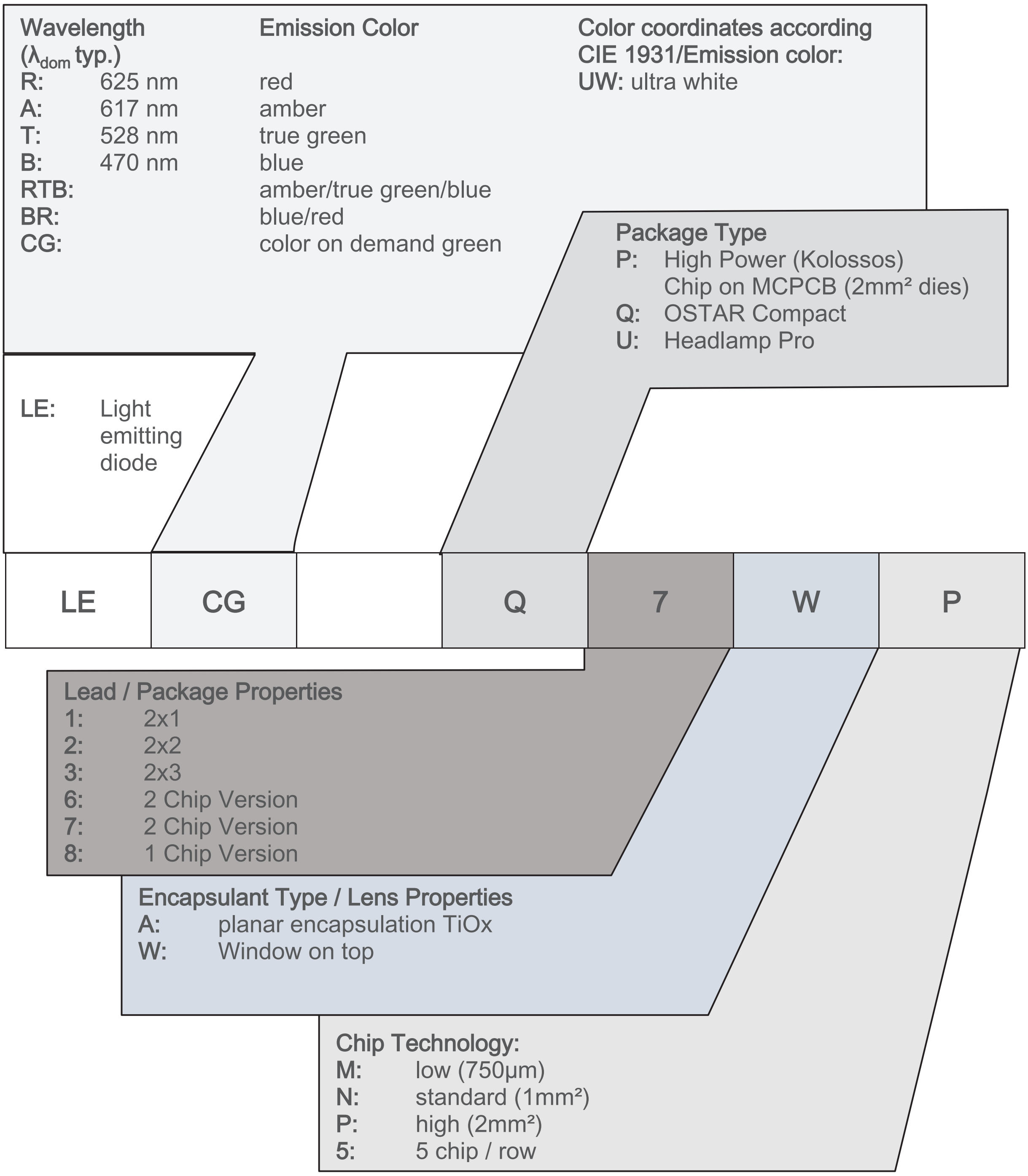
Moisture-sensitive product is packed in a dry bag containing desiccant and a humidity card according JEDEC-STD-033.

Type Designation System



Wavelength (λ_{dom} typ.) | **Emission Color** | **Color coordinates according CIE 1931/Emission color:**

Wavelength (λ_{dom} typ.)		Emission Color
R:	625 nm	red
A:	617 nm	amber
T:	528 nm	true green
B:	470 nm	blue
RTB:		amber/true green/blue
BR:		blue/red
CG:		color on demand green

UW: ultra white

LE: Light emitting diode

Package Type
P: High Power (Kolossos) Chip on MCPCB (2mm² dies)
Q: OSTAR Compact
U: Headlamp Pro

Lead / Package Properties
1: 2x1
2: 2x2
3: 2x3
6: 2 Chip Version
7: 2 Chip Version
8: 1 Chip Version

Encapsulant Type / Lens Properties
A: planar encapsulation TiOx
W: Window on top

Chip Technology:
M: low (750µm)
N: standard (1mm²)
P: high (2mm²)
5: 5 chip / row

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 moderate risk (exposure time 0.25 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 https://ams-osram.com/support/application-notes

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] **Brightness:** Brightness values are measured during a current pulse of typically 25 ms, with an internal reproducibility of ±8 % and an expanded uncertainty of ±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] **Wavelength:** The wavelength is measured at a current pulse of typically 25 ms, with an internal reproducibility of ±0.5 nm and an expanded uncertainty of ±1 nm (acc. to GUM with a coverage factor of k = 3).

[4] **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.

[5] **Forward Voltage:** Forward voltages are tested at a current pulse duration of 1 ms and a tolerance of ±0.05 V and an expanded uncertainty of ±0.1 V (acc. to GUM with a coverage factor of k = 3).

[6] **Thermal Resistance:** Rth max is based on statistic values (6σ) used for Derating.

[7] **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.

[8] **Tolerance of Measure:** Unless otherwise noted in drawing, tolerances are specified with ±0.1 and dimensions are specified in mm.

[9] **Tape and Reel:** All dimensions and tolerances are specified acc. IEC 60286-3 and specified in mm.

Revision History

Version	Date	Change
1.7	2018-12-19	Wavelength Groups Characteristics
1.8	2020-04-16	Dimensional Drawing Schematic Transportation Box Dimensions of Transportation Box
1.9	2020-07-09	Wavelength Groups
1.10	2020-10-06	Maximum Ratings
1.11	2020-12-16	Characteristics
1.12	2021-01-25	Wavelength Groups
1.13	2021-09-23	Recommended Solder Pad
1.13	2023-05-23	Recommended Solder Pad New Layout Applications
1.14	2023-05-23	Discontinued

Discontinued

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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