OSRAM LE A P1MS

Datasheet

Preliminary datasheet version

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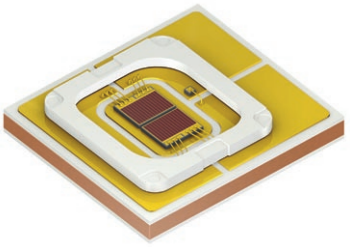
OSRAM

OSRAM OSTAR® Projection Power

LE A P1MS

OSRAM OSTAR Projection Power is a high luminance LED for projection applications.



Applications

- Projection & Display

Features

- Package: OSTAR High Power Projection
- Chip technology: Thinfilm
- Typ. Radiation: 120° (Lambertian emitter)
- Color: λ_{dom} = 614 nm (● amber)
- ESD: 2 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)

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Ordering Information

Type	Luminous Flux [1] I_F = 4000 mA Φ_V	Ordering Code
LE A P1MS-RQRU-2	1210 ... 1800 lm	Q65113A4265

Maximum Ratings

Parameter	Symbol		Values
Storage Temperature	T_{stg}	min. max.	-40 °C 100 °C
Junction Temperature	T_j	max.	125 °C
Forward Current $T_j = T_{j,max}$	I_F	min. max.	200 mA 5500 mA
Forward Current pulsed D = 0.6; f = 240 Hz; $T_j = T_{j,max}$	$I_{F\ pulse}$		5500 mA
Surge Current $t_P \leq 50$ µs; D = 0.1 ; $T_j = T_{j,max}$	I_{FS}	max.	6900 mA
ESD withstand voltage acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)	V_{ESD}		2 kV
Reverse current [2)]	I_R	max.	200 mA
Max. voltage difference anode-board, cathode-board	$\lvert\Delta V_{a\text{-}b}\rvert$, $\lvert\Delta V_{c\text{-}b}\rvert$	max.	40 V

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Characteristics

T_{Board} = 25 °C; I_F = 4000 mA; f = 1000 Hz; D = 0.25

Parameter	Symbol		Values
Peak Wavelength	λ_{peak}	typ.	622 nm
Dominant Wavelength [3]	λ_{dom}	min. typ. max.	612 nm 614 nm 618 nm
Spectral bandwidth at 50% $I_{rel,max}$	$\Delta\lambda$	typ.	17 nm
Viewing angle at 50% I_V	2φ	typ.	120 °
Radiating surface	A_{color}	typ.	1.95 x 1.35 mm²
Partial Flux acc. CIE 127:2007 [4] I_F = 4000 mA	$\Phi_{E/V,\ 120°}$	typ.	0.77
Forward Voltage [5] I_F = 4000 mA	V_F	min. typ. max.	5.6 V 6.0 V 7.0 V
Reverse voltage (ESD device)	$V_{R\ ESD}$	min.	45 V
Reverse voltage [2] I_R = 20 mA	V_R	max.	1.2 V
Real thermal resistance junction/solderpoint	$R_{thJS\ real}$	typ.	1.3 K / W
Electrical thermal resistance junction/solderpoint with efficiency η_e = 22 %	$R_{thJS\ elec.}$	typ.	1.0 K / W

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Brightness Groups

Group	Luminous Flux [1] I_F = 4000 mA min. Φ_V	Luminous Flux [1] I_F = 4000 mA max. Φ_V
RQ	1210 lm	1300 lm
RR	1300 lm	1400 lm
RS	1400 lm	1500 lm
RT	1500 lm	1640 lm
RU	1640 lm	1800 lm

Wavelength Groups

Group	Dominant Wavelength [3] min. λ_{dom}	Dominant Wavelength [3] max. λ_{dom}
2	612 nm	618 nm

Group Name on Label

Example: RQ-2

Brightness	Wavelength
RQ	2

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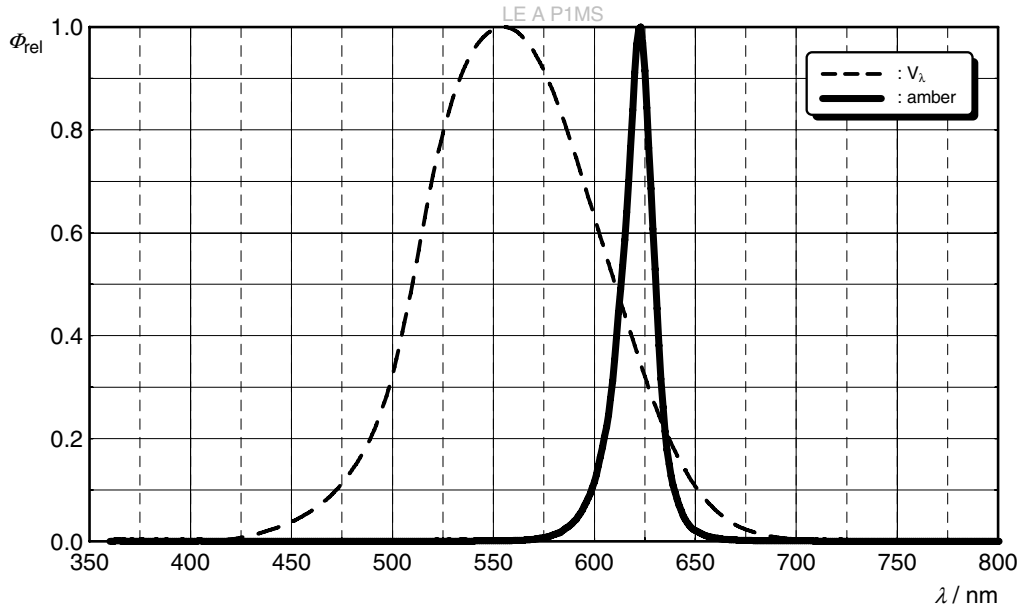
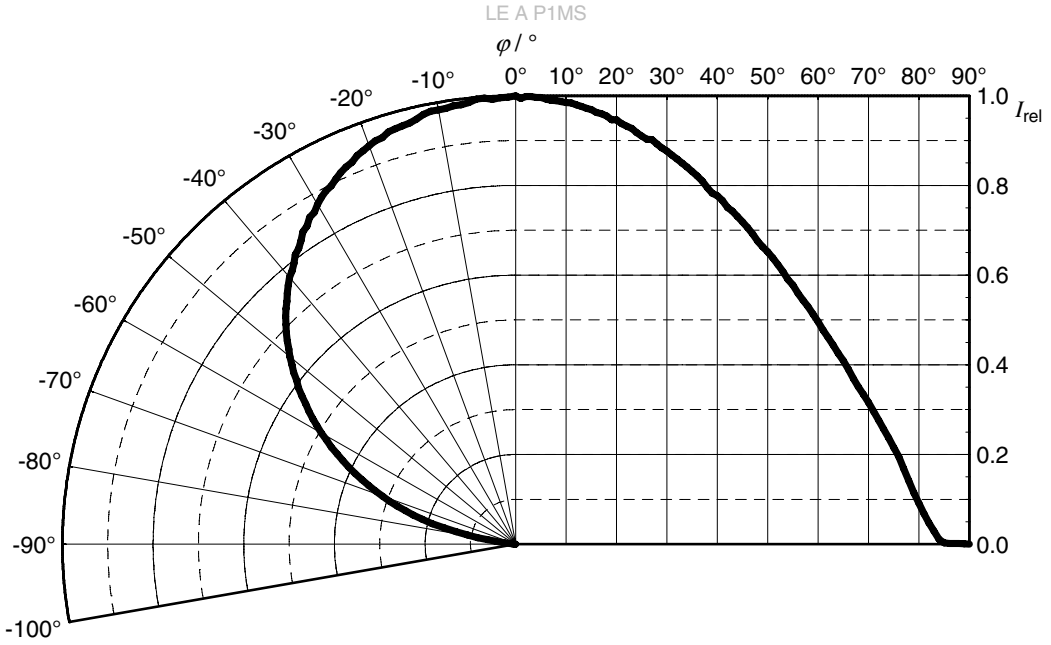
Relative Spectral Emission [4)]

$\Phi_{rel} = f(\lambda)$; I_F = 4000 mA; T_J = 25 °C



Radiation Characteristics [4)]

$I_{rel} = f(\phi)$; T_J = 25 °C



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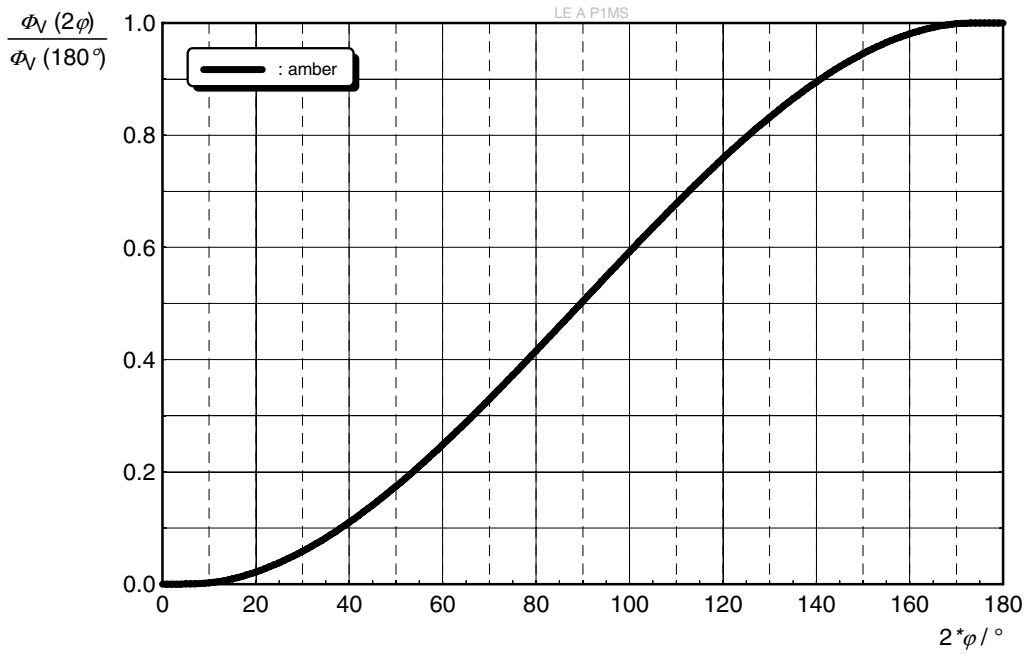
Relative Partial Flux [4)]

$\Phi_v(2\varphi)/\Phi_v(180°) = f(\varphi)$; T_J = 25 °C



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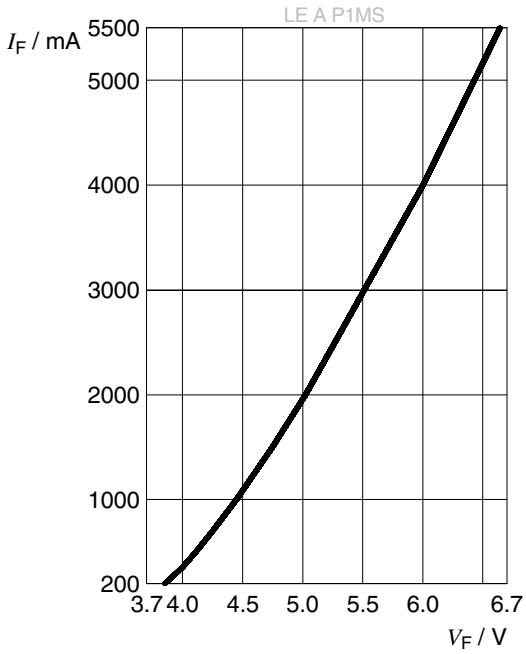
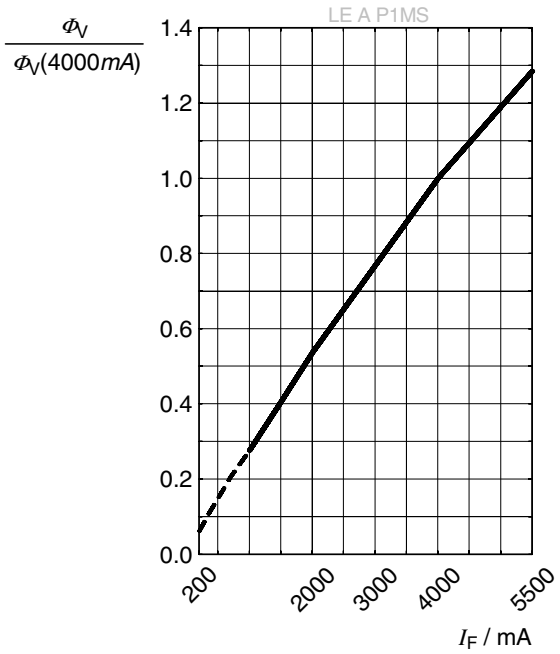
Forward current [4]

$I_F = f(V_F)$; T_J = 25 °C



Relative Luminous Flux [4], [6]

$\Phi_v/\Phi_v(4000\ mA) = f(I_F)$; T_J = 25 °C



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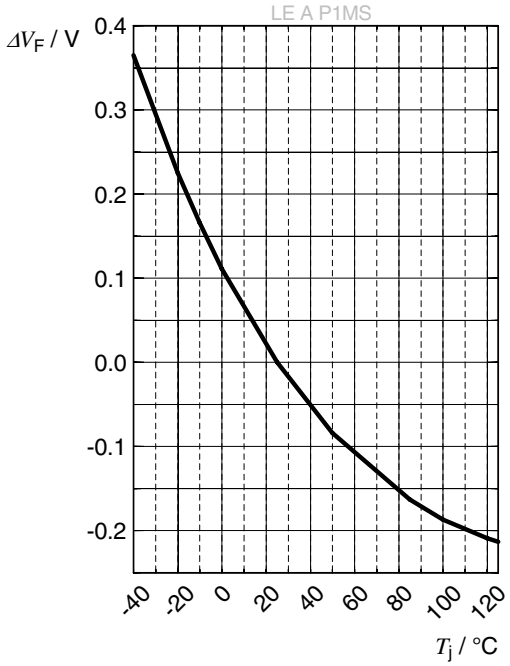
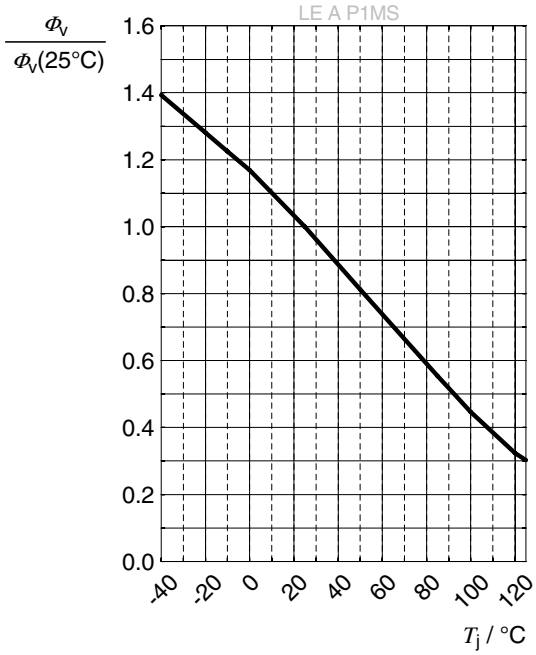
Forward Voltage [4)]

$\Delta V_F = V_F - V_F(25\ °C) = f(T_j);\ I_F = 4000\ mA$



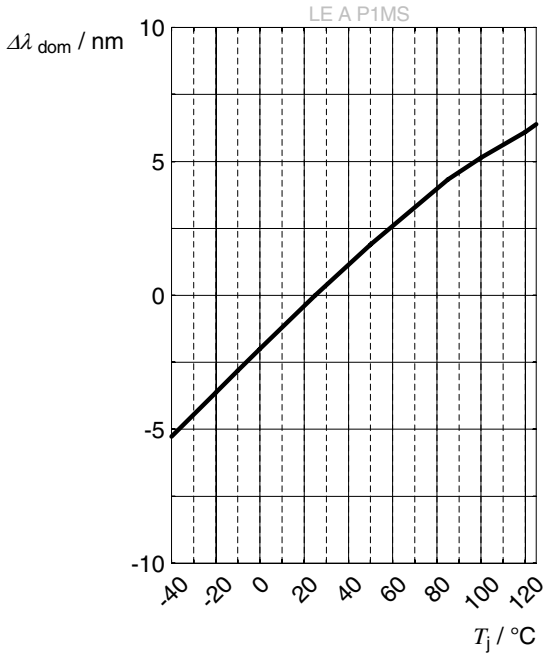
Relative Luminous Flux [4)]

$\Phi_v/\Phi_v(25\ °C) = f(T_j);\ I_F = 4000\ mA$



Dominant Wavelength [4)]

$\Delta\lambda_{dom} = \lambda_{dom} - \lambda_{dom}(25\ °C) = f(T_j);\ I_F = 4000\ mA$



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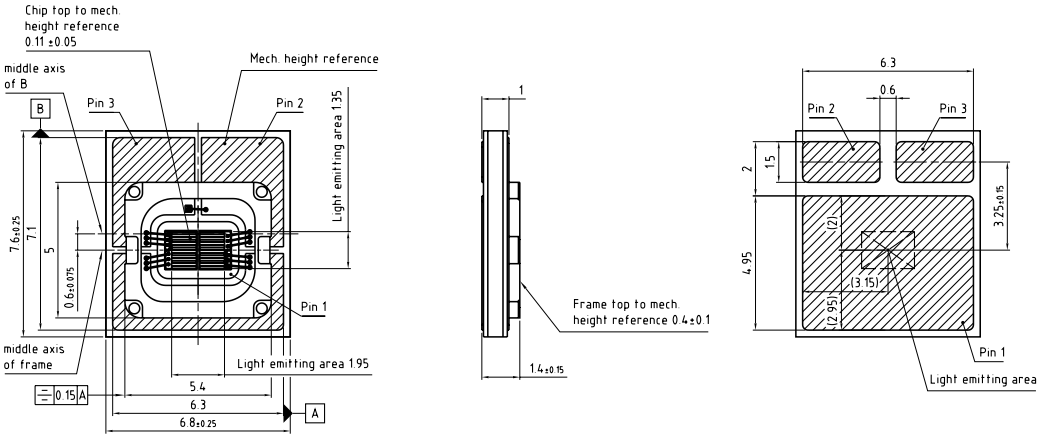
Dimensional Drawing [7)]



lead finish Au
general tolerance ±0.1

Pin 1: Substrate potential, isolated from Cathode and Anode
Pin 2: Cathode
Pin 3: Anode

C63062-A4436-A1-03

Further Information:

Approximate Weight: 380.0 mg

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

Notes: Package not suitable for any kind of wet cleaning or ultrasonic cleaning.

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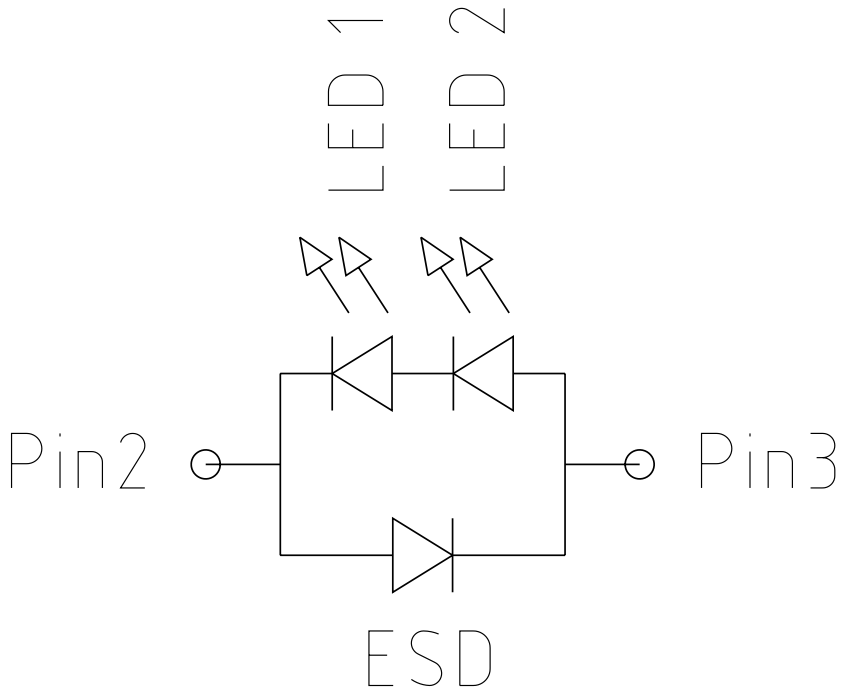
Electrical Internal Circuit



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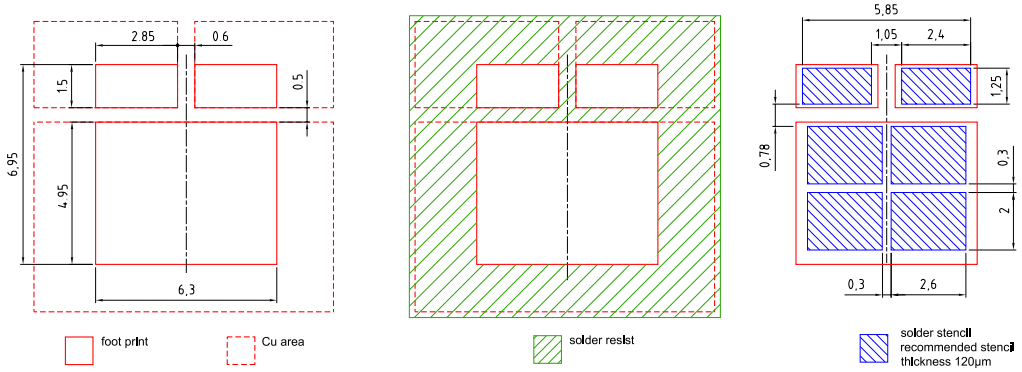
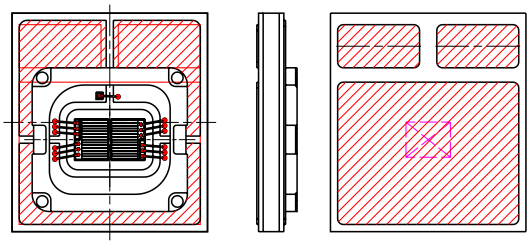
Recommended Solder Pad [7)]



Component Location on Pad



E062.3010.313-01

For protection during reflow soldering and handling a foil is attached to the device. The foil has to be removed before operation. For superior solder joint connectivity results we recommend soldering under standard nitrogen atmosphere. To ensure a high solder joint reliability and to minimize the risk of solder joint cracks, the customer is responsible to evaluate the combination of PCB board and solder paste material for his application.

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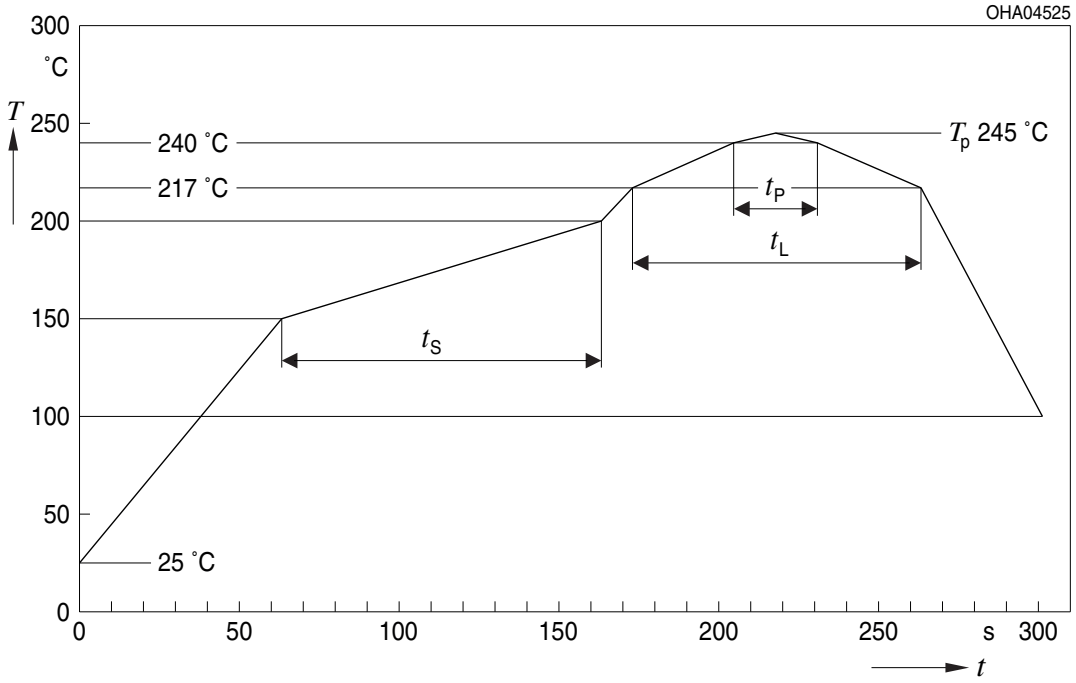
Reflow Soldering Profile

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

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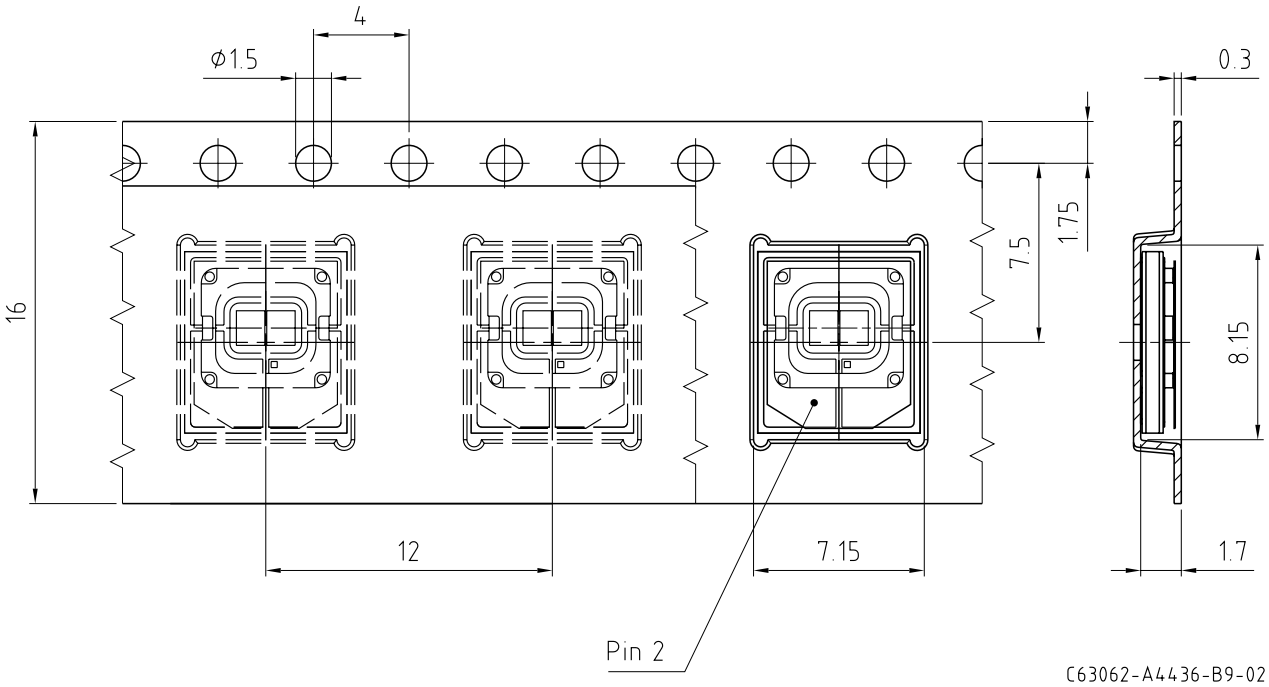
Taping [7)]



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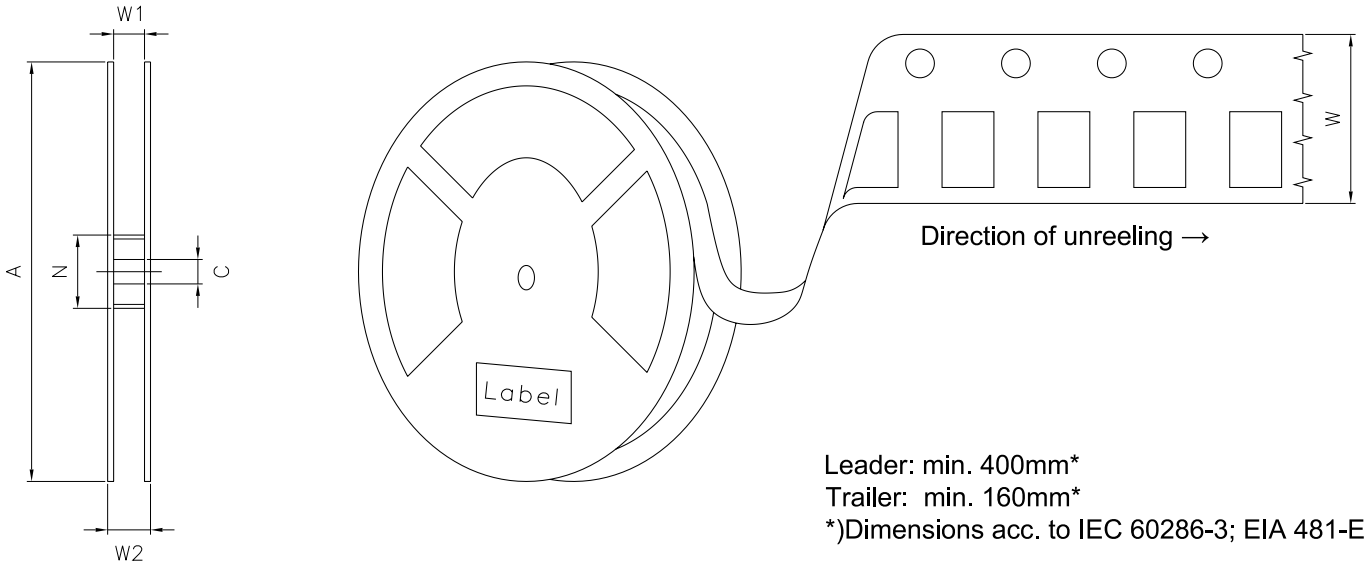
Tape and Reel [8)]



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	16 + 0.3 / - 0.1 mm	60/100 mm	16.4 + 2 mm	22.4 mm	500

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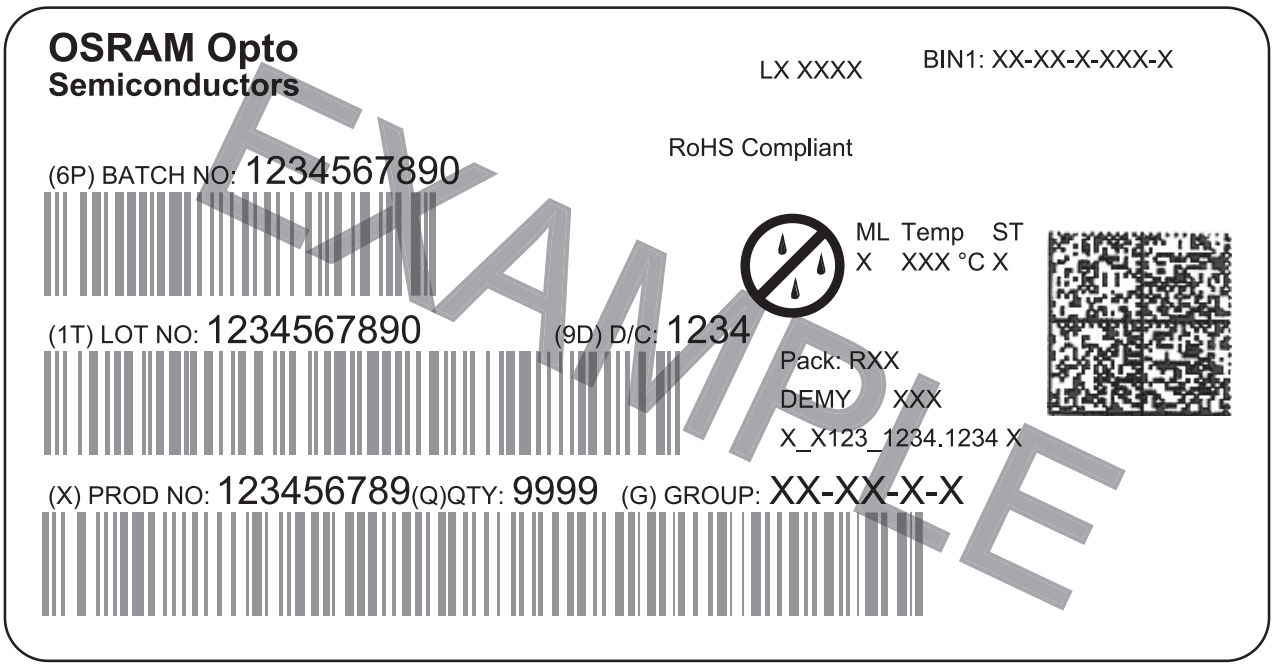
Barcode-Product-Label (BPL)



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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.

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

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Glossary

1) **Brightness:** Brightness values are measured during a pulse train of 100 ms with a pulse width of 250 µs and a frequencey of 1 kHz, with an internal reproducibility of +/- 8 % and an expanded uncertainty of +/- 11 % (acc. to GUM with a coverage factor of k = 3). The peak brightness is calculated according to the pulse duration and frequency.

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 during a pulse train of 100 ms with a pulse width of 250 µs and a frequencey of 1 kHz , 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:** The forward voltage is measured during a pulse of typical 250 µs, with an internal reproducibility of +/- 0,05 V and an expanded uncertainty of +/- 0,1 V (acc. to GUM with a coverage factor of k=3).

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.

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Revision History

Version	Date	Change
0.0	2022-08-01	Initial Version
0.1	2022-09-26	Characteristics

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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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