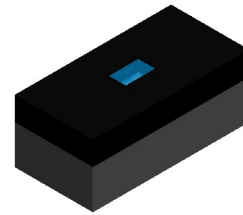


# LA PL110RBD

140° Hyper blue (470 nm) black ceramic 0402 LED



The point source LED is designed for applications, where an extremely small emission point without any bondwires is needed. The LED is produced by using a high efficiency LED flip chip mounted on a small ceramic aluminum oxide submount, filled to the emitting surface with black silicone. The point source LED is easy to handle and IR-reflow solderable. The chip placement accuracy relative to the package is very high.



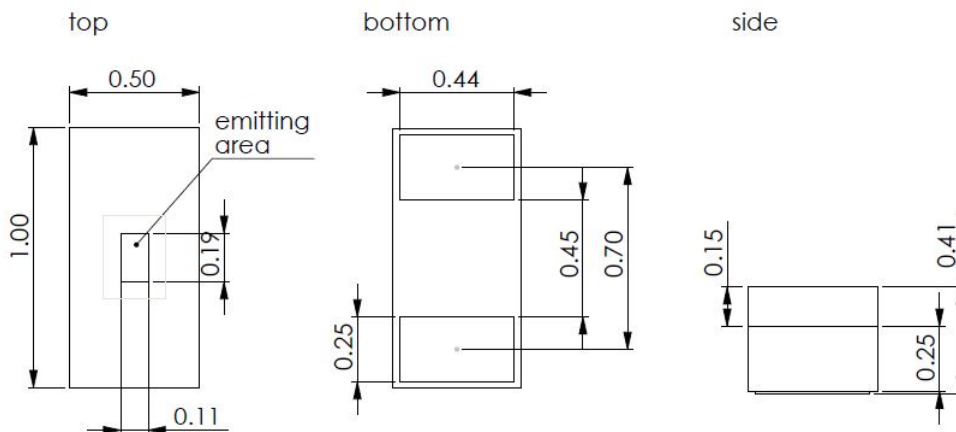
## Features

- Low power
- Small emitting ares of 110 x 190  $\mu\text{m}^2$
- Black silicon SMT package
- High optical efficiency
- Point source chip
- Moisture sensitivity level (MSL) 3

## Applications

- Medical
- Sensors
- Industry
- Light grids

## Delineation



All dimensions in mm.

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## Electro-optical characteristics ( $T_A = 25^\circ\text{C}$ )<sup>2</sup>

PARAMETER	SYMBOL	CONDITION	MIN.	TYP. <sup>1</sup>	MAX.	UNIT
Radiant power	$\Phi_e$	$I_F = 20\text{ mA}$	2	4	12	mW
Radiant intensity	$I_e$	$I_F = 20\text{ mA}$		1.0		mW/sr
Forward voltage	$V_F$	$I_F = 20\text{ mA}$	2.6	3.1	3.6	V
Peak wavelength	$\lambda_{\text{peak}}$	$I_F = 20\text{ mA}$	450	470	480	nm
Spectral width	RMS	$I_F = 20\text{ mA}$		21		nm
Beam divergence angle	$\Theta$	$I_F = 20\text{ mA}$		140		°

## Maximum ratings ( $T_A = 25^\circ\text{C}$ )<sup>3</sup>

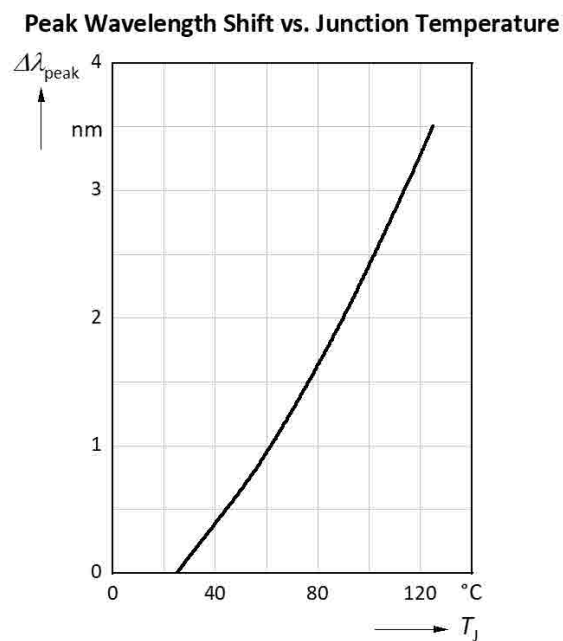
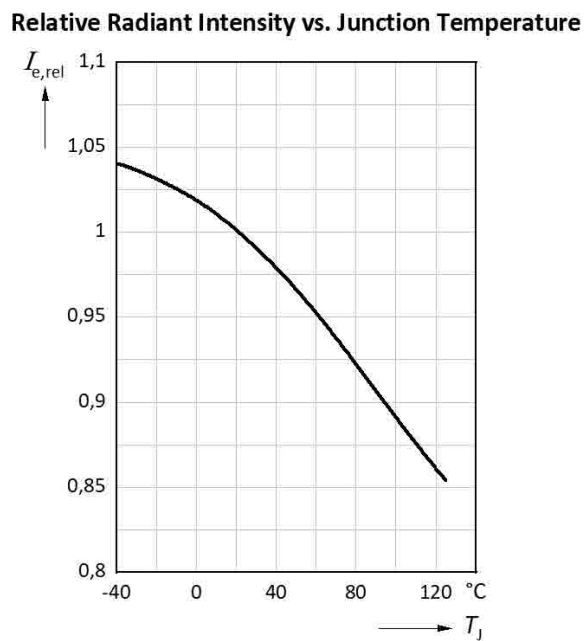
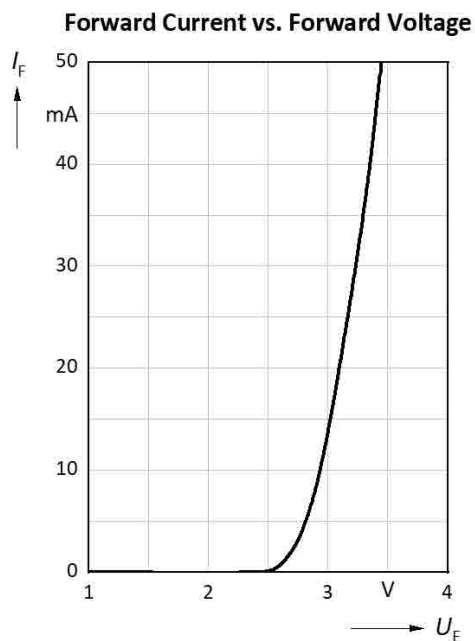
PARAMETER	SYMBOL	CONDITION	MINIMUM	MAXIMUM	UNIT
Operating current	$I_{f,\text{max}}$			50	mA
Pulse current	$I_P$	$T_P = 10\mu\text{s}$ , $D = 2\%$		200	mA
Operating temperature range	$T_{\text{op}}$		-40	100	°C
Storage temperature	$T_{\text{st}}$		-40	100	°C
Reverse voltage	$V_R$	$I_R = 5\mu\text{A}$	5		V
Power consumption	$P_{\text{tot}}$			180	mW
Junction temperature	$T_j$			125	°C

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## Typical characteristics graphs



# LA PL110RBD

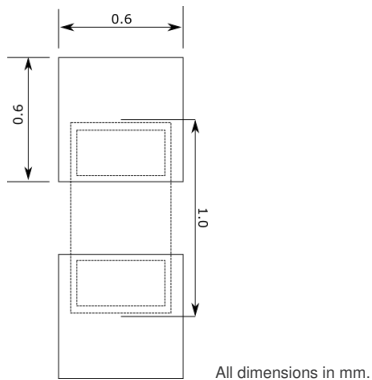
140° Hyper blue (470 nm) black ceramic 0402 LED



## Thermal characteristics

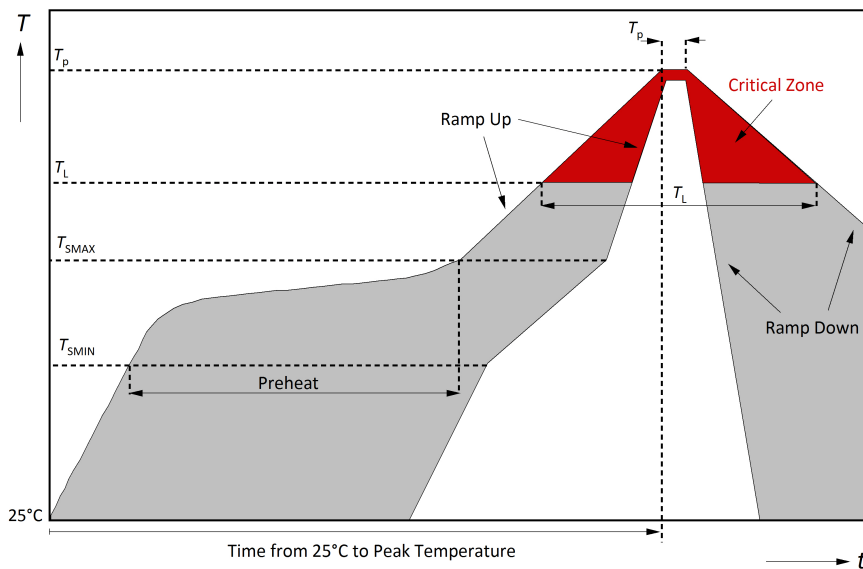
PARAMETER	SYMBOL	VALUE	UNIT
Soldering temperature	$T_{\text{sold}}$	260	°C

## Recommended solderpad



## Soldering

Soldering Profile (Temperature vs. Time)



# LA PL110RBD

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Recommended reflow soldering conditions following IPS/JEDEC J-STD-020.

Pb-FREE ASSEMBLY	CONDITION	VALUE	UNIT
Ramp-Up rate from $T_{Smax}$ to $T_P$	$T_{Smax} = 200\text{°C}$ ; $T_P = 260\text{°C}$	3	°C/s
Preheat between $T_{Smin}$ and $T_{Smax}$	$T_{Smin} = 150\text{°C}$ ; $T_{Smax} = 200\text{°C}$	180	s
Temperature maintained above $T_L$	$T_L = 217\text{°C}$	150	s
Peak temperature $T_P$		245 - 260	°C
Time within 5°C of actual peak temp.		20	s
Maximum Ramp-Down rate		6	°C/s
Maximum time from 25°C to $T_P$	$T_P = 260\text{°C}$	8	min

Actual solder profile may vary from the example given, and is very much depending on wave type, machine configuration, geometrical configuration, board shape etc. It is strongly recommended to optimize and evaluate the actual soldering conditions carefully for each individual project before releasing the soldering process. All temperatures refer to the topside of the package. The LED is designed to be reflow soldered. Hand or dip soldering is not recommended and also not suitable for this package. Reflow soldering must not be done more than two times. When the LED PKG is cooled at the maximum temperature, a rapid temperature fall is not recommended.

## Important usage and application informations

Lead free product - RoHS compliant.

All products, product specifications and data to improve reliability, function, design or otherwise are subject to change without notice. The information describes the type of component and shall not be considered as assured characteristics. Due to technical requirements components may contain dangerous substances. For information on the types in question please contact our Sales Organization.

## Handling and storage conditions

Please be careful when handling the products, particularly if an over-voltage exceeds the maximum rating. The overflow in energy may cause damage to the products. In addition these products are sensitive to static electricity. Customers have to take care when handling the products to ensure that the handling process is fully protected against static generation. Ensure that products are grounded and that the facility has conductive mats, antistatic uniforms and shoes. Antistatic containers are considered to be a good insurance against static electricity. The soldering iron point should be properly grounded. An atmospheric ionizer is recommended for use in the facility where static could be generated. Storage ambient conditions for all LEDs in sealed packages must be within  $T_a = 10 \dots 40\text{°C}$  and relative humidity  $< 60\%$ . LEDs in opened packages must be used within 2 weeks after opening. Storage time under the conditions above in sealed packages must not exceed 24 months. It is recommended to do a heat treatment of the LEDs before soldering. The baking should be at  $65 \pm 5\text{°C}$  for 10 to 24 hours. Humidity in this case should not exceed 10% relative humidity. When handling the LED with tweezers, please take it in a direction parallel to

the electrode separation line. Do not touch the quartz glass. Do not do rapid cooling immediately after soldering. It can cause the LED to fail.

### **Packing**

LEDs are packaged automatically on reels and packed into paperboard containers. Labels for identification are placed on the box. The label shows company name and address, LED type, quantity and lot number. The box is hermetically sealed in a plastic bag for shipment.

### **Returns and complaints**

For complaints and returns of material a RMA-number is necessary. Samples for analysis purposes can be send to us without credit.

### **Shipping conditions**

If not otherwise arranged, the "General Terms of Business of Light Avenue GmbH" apply for any shipment. If this document is not familiar to you, please request it at our nearest sales office.

## Disclaimer

### Attention please!

- **Components used in life-support devices or systems must be expressly authorized for such purpose!**

Critical components<sup>4</sup> may only be used in life-support devices<sup>5</sup> or systems with the express written approval by us.

- All products, product specifications and data to improve reliability, function, design or otherwise are subject to change without notice .
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- The information describes the type of component and shall not be considered as assured characteristics. Due to technical requirements components may contain dangerous substances. For information on the types in question please contact our Sales Organization.
- Lead free product - RoHS compliant.
- The quality level of the final visual inspection shall comply to an AQL of 1.0 (according to MIL-STD-105E, level II), if the customer performs an incoming visual inspection of a shipment.

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- All chips are checked according to the producer's specification of the visual inspection. If this document is not familiar to you, please request it at our nearest sales office.

## Changes

VERSION	DATE	CONTENT
1.0	17.02.2021	Change management has started, technical graphs have been added (page 3-4).
2.0	18.01.2022	New address and adjustment of electro-optical characteristics.

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<sup>1</sup>Due to the special conditions of the manufacturing processes of LED, 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.

<sup>2</sup>Measurements are done with an accuracy of  $\pm 15\%$ . Correlation to customer's equipment and products is required.

<sup>3</sup>Maximum ratings are package dependent and may differ between packages. The forward current is not limited by the die but by the effect of the LED junction temperature on the package. If you need more information on pulsed operation, please contact your next sales office about possible driving conditions. If not otherwise specified the maximum pulse current may not exceed the maximum current in continuous mode.

<sup>4</sup>A critical component is a component used in a life-support device or system whose failure can reasonably be expected to cause the failure of that life-support device or system, or to affect its safety or the effectiveness of that device or system.

<sup>5</sup>Life support devices or systems are intended(a) to be implanted in the human body, or(b) to support and/or maintain and sustain human life. If they fail, it is reasonable to assume that the health and the life of the user may be endangered.