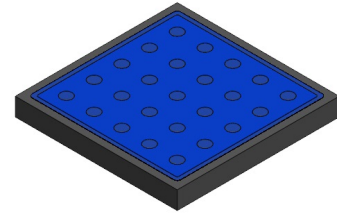


# LA HB43FP6

LED Chip Hyper blue (453 nm) 43 mil



Light Avenue Premium Edition LED series is designed for high performance consumer applications. Remarkable light extraction is reached by a particular top emitting design. It is possible to group this chip as narrow as possible without losing any space on the PCB. The product can be soldered with a classical reflow process.



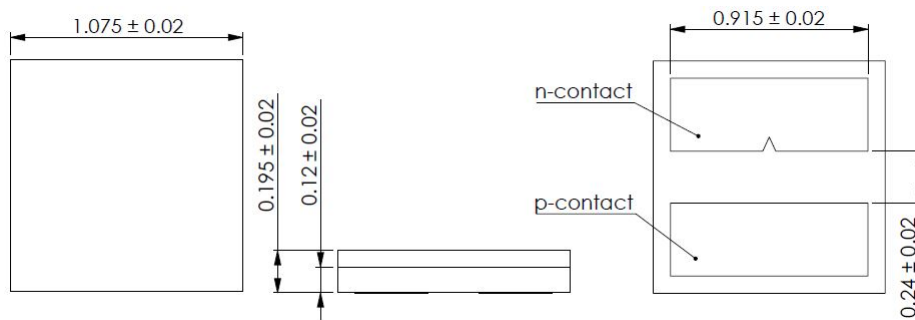
## Features

- Highest brightness InGaN chip
- Lambertian radiation
- Grouping: radiant power
- ESD sensitive device
- Flipchip

## Applications

- Solid state light

## Delineation



All dimensions in mm.

## Mechanical characteristics

DESCRIPTION		MINIMUM	TYPICAL <sup>1</sup>	MAXIMUM
Chip size	( $\mu\text{m}$ )	1045	1075	1105
Chip height	( $\mu\text{m}$ )	95	120	145
Dimension cathode (n)	( $\mu\text{m}$ )	860 x 280	915 x 335	970 x 390
Dimension anode (p)	( $\mu\text{m}$ )	860 x 280	915 x 335	970 x 390
Bottom contact	Cathode (n), Au and Anode (p), Au			
Die attach	Soldering			

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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
Forward voltage	$V_F$	$I_F = 700\text{ mA}$	2.7	2.85	3.2	V
Reverse voltage	$V_R$	not designed for reverse operation				
Peak wavelength	$\lambda_{\text{peak}}$	$I_F = 700\text{ mA}$	445	453	455	nm
Radiant power	$\Phi_e$	$I_F = 700\text{ mA}$	800		1185	mW
Viewing angle	$2\theta_{1/2}$	$I_F = 700\text{ mA}$		120		°

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

PARAMETER	SYMBOL	VALUE	UNIT
Operating temperature range	$T_{\text{op}}$	-40...85	°C
Storage temperature range	$T_{\text{stg}}$	-40...85	°C
LED junction temperature	$T_j$	125	°C
Forward current	$I_F$	30...1000	mA

## Binning ( $I_F = 700\text{ mA}$ )

		WAVELENGTH (NM)		
		445-450	447.5-452.5	450-455
Radiant power (mW)	> 800	Y36	YM36	Z36
	> 1000	Y37	YM37	Z37

There may be more than one bin on one single foil. Single bins cannot be ordered. Customized specifications are possible. Please contact our nearest sales office for further information.

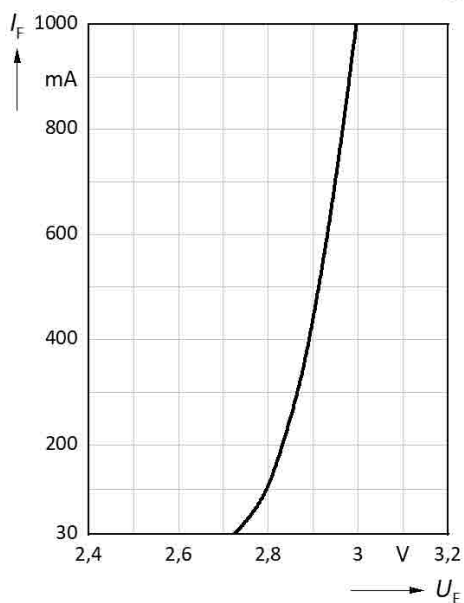
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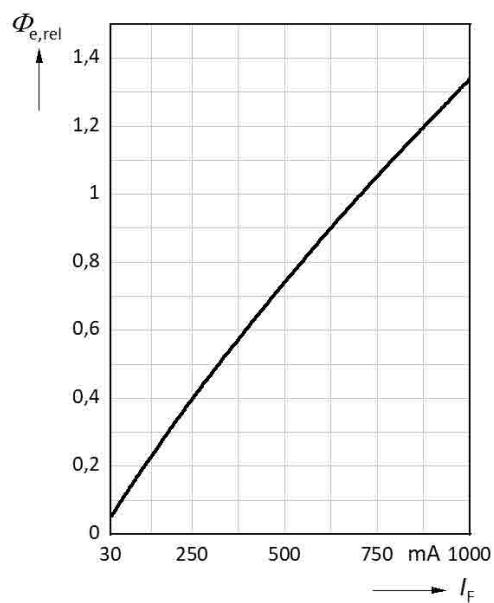


## Typical characteristics graphs

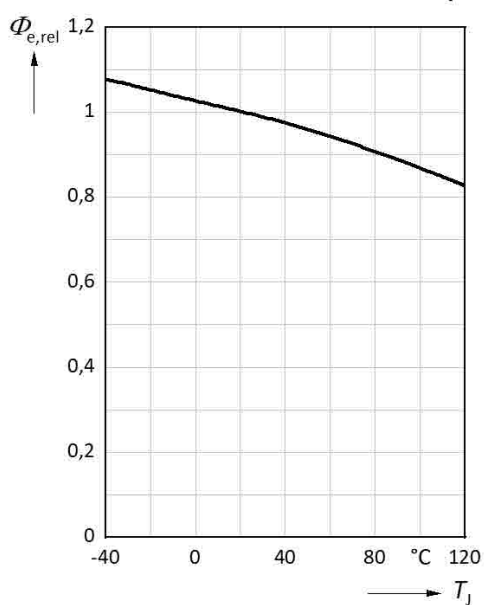
Forward Current vs. Forward Voltage



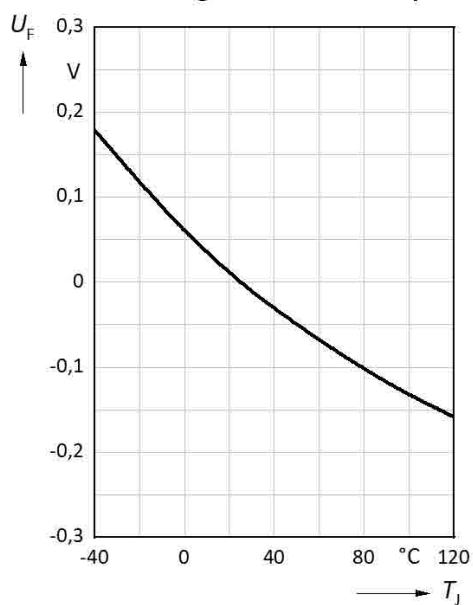
Relative Radiant Flux vs. Forward Current



Relative Radiant Flux vs. Junction Temperature



Forward Voltage vs. Junction Temperature

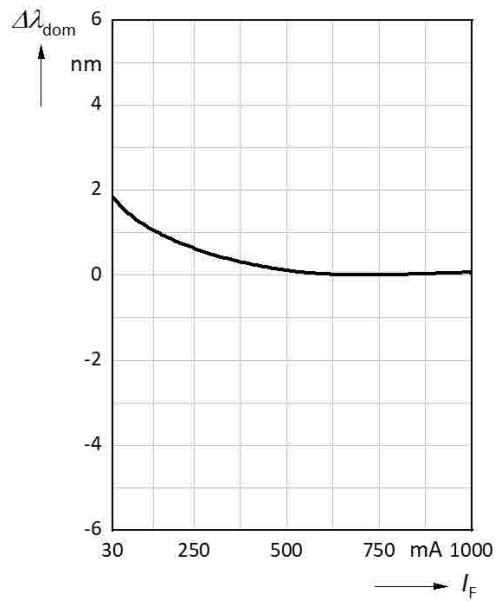


# LA HB43FP6

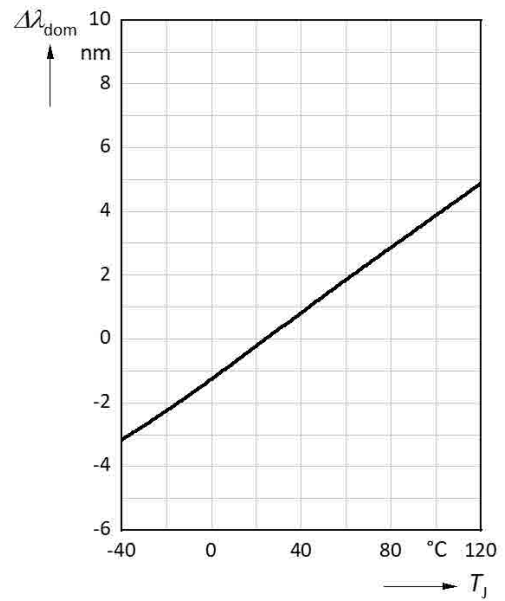
LED Chip Hyper blue (453 nm) 43 mil



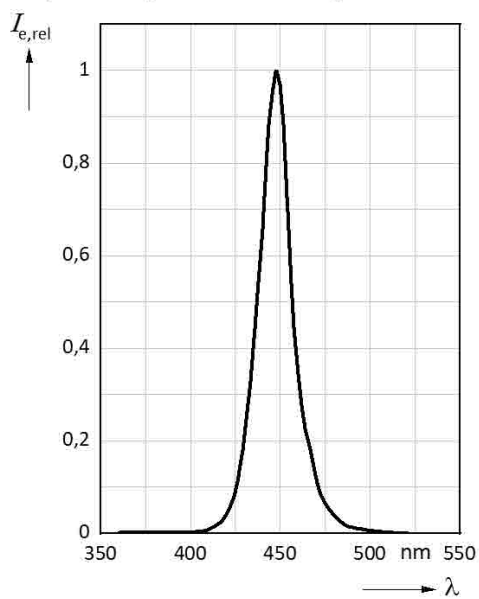
Dominant Wavelength Shift vs. Forward Current



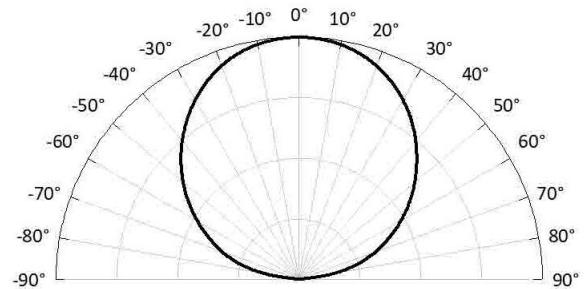
Dominant Wavelength Shift vs. Junction Temperature



Spectrum (Relative Intensity vs. Wavelength)



Radiation Pattern



# LA HB43FP6

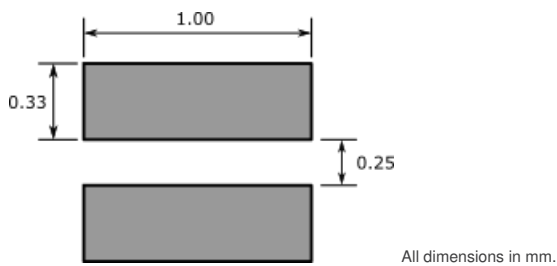
LED Chip Hyper blue (453 nm) 43 mil



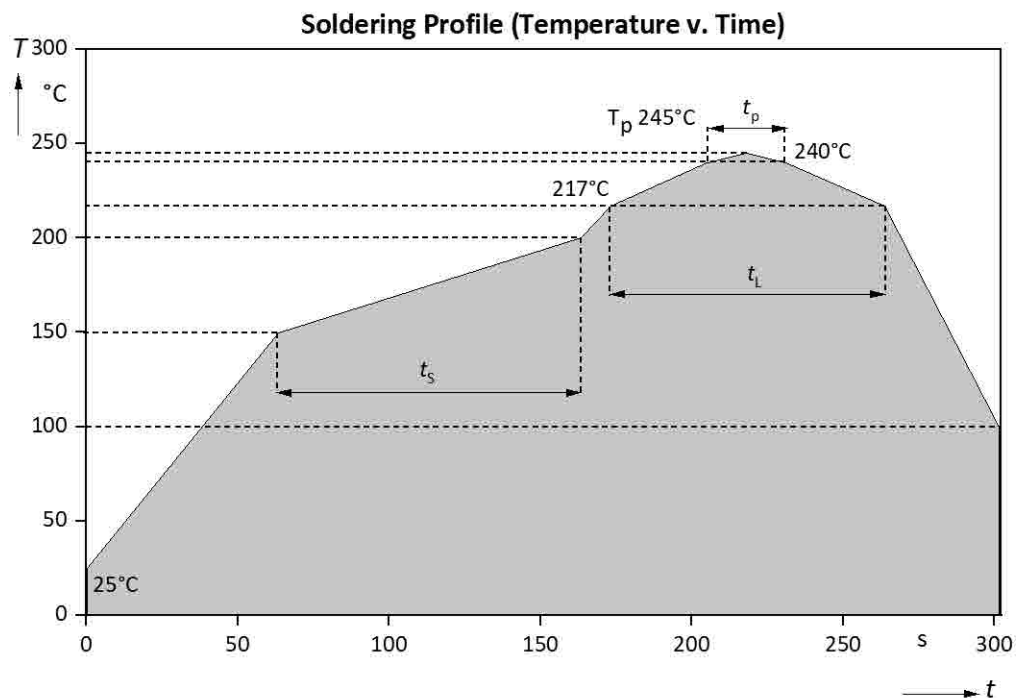
## Thermal characteristics

PARAMETER	SYMBOL	VALUE	UNIT
Thermal resistance junction ambient	$R\Theta_{JA}$	6.3	K/W
Soldering temperature	$T_{\text{sold}}$	245	°C

## Recommended solderpad



## Soldering



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

Pb-FREE ASSEMBLY	MIN	TYP	MAX	UNIT
Ramp-Up rate to preheat 25 °C to 150 °C		2	3	°C/s
Time $t_s$ $T_{Smin}$ to $T_{Smax}$	60	100	120	s
Ramp-up rate to peak $T_{Smin}$ to $T_P$		2	3	°C/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 actual peak temp.	10	20	30	s
Ramp-Down rate		3	6	°C/s
Time 25 °C to $T_P$			480	s

## Handling and storage conditions

Storage time for wafers in sealed condition is not limited by the die itself, but may be limited by the adhesion of the blue foil (storage ambient conditions:  $T_a = 15 \dots 30^\circ\text{C}$ ; relative humidity:  $< 60\%$ , vertical storage). Customer has to make sure that there is no glue from the adhesive foil on the backside either by a die shear test or by visual inspection of the backside before production. The hermetically sealed shipment lot shall be opened under temperature and moisture controlled cleanroom environment only. Customers have to follow the according rules for desposition as the material can be hazardous for humans and the environment. Chips are placed on a blue foil, which may contain the following substance in a concentration of circ.18% wt: Bis (2-ethyl(hexyl)phthalate) (DEHP) [CAS #: 117-81-7; EC # 204-211-0]. Dice have to be handled ESD sensitive.

## Packing

LEDs are packaged automatically on reels with a quantity of 600 pieces. Labels for identification of cathode and anode and with the lot data are placed on the reel.

## Design objectives

The chip design was developed and released based on the producer's standard assembly procedures and packaging. Bond strength properties are in accordance to MIL-STD-750D, method 2037. Whether the chip fits to the customer's products with its according die and wire bond procedures and packaging must be evaluated by the customer himself. If workability problems arise after this release a mutually conducted problem solving procedure has to be set up, if the chips are suspected of contributing to the problems. The chips are produced with best effort, but on chip level a subset of the chip characteristics can be determined only. Performance of the chip in the customer's products can only be determined by the customer himself.

## 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	06.01.2020	Change management has started, technical graphs have been added (page 3-4).

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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.