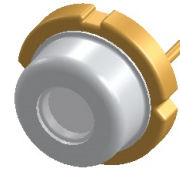


# LA LM90HBS1

Hyper blue (447 nm) Multimode Laser Diode



Light Avenue laser series is designed for high performance consumer applications and offers an efficient radiation source for cw and pulsed laser operation. The TO90 packaged Hyper blue Multimode laser diode reaches an output power of 3.7 W at typical 447 nm wavelength.



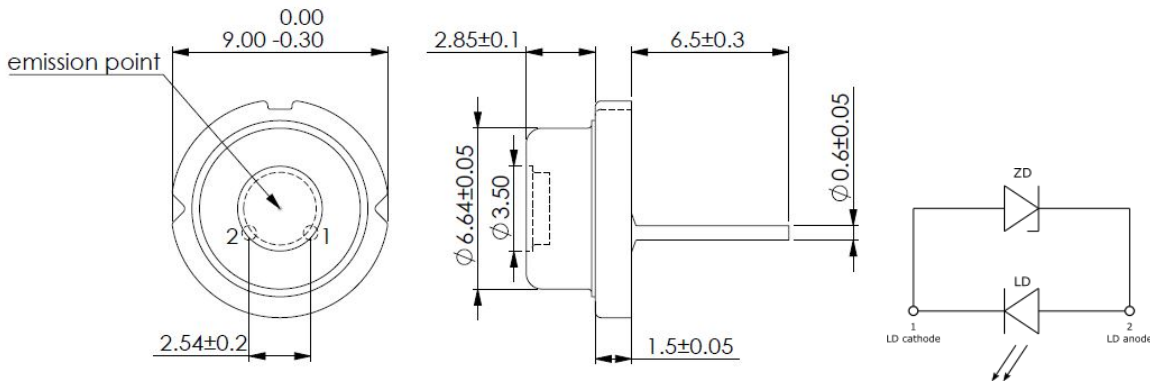
## Features

- Multimode
- 9.0 mm TO package

## Applications

- Consumer
- Sensors
- Projection
- Metrology

## Delineation



All dimensions in mm.

## Material data

DESCRIPTION	MATERIAL	FINISH
Laser diode chip	InGaN	
Stem		Au plated
Cap	45 alloy	Ni, Pd plated
Lead pins	Kovar	Au plated
Window	Borosilicated glass	typ. n =1.516

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

PARAMETER	SYMBOL	CONDITION	MIN.	TYP. <sup>1</sup>	MAX.	UNIT
Threshold current	$I_{th}$			250	400	mA
Forward voltage	$V_F$	$\Phi_e = 3500\text{ mW}$			5.5	V
Forward current	$I_F$	$\Phi_e = 3500\text{ mW}$		2200	2500	mA
Peak wavelength	$\lambda_{peak}$	$\Phi_e = 3500\text{ mW}$	440	447	455	nm
FWHM parallel <sup>Note1</sup>	$\Theta_{  }$	$\Phi_e = 3500\text{ mW}$	6	9	13	°
FWHM perpendicular <sup>Note1</sup>	$\Theta_{\perp}$	$\Phi_e = 3500\text{ mW}$	41	49	57	°
Total power dissipation	$P_{tot}$			6.5		W

Note1: Parallel to the junction plane, perpendicular to the junction plane.

## Maximum ratings ( $T_A = 25\text{ °C}$ )

PARAMETER	SYMBOL	CONDITION	MINIMUM	MAXIMUM	UNIT
Optical power	$\Phi_{e,max}$			3.7	W
Operating temperature	$T_{op}$		-40	120	°C
Storage temperature	$T_{st}$		-40	135	°C
Reverse current	$I_R$			20	mA

## Thermal characteristics

PARAMETER	SYMBOL	VALUE	UNIT
Soldering temperature <sup>Note2</sup>	$T_{sold}$	260	°C
Thermal Resistance (junction to case)	$R_{th}$	9.0	K/W

Note2: Soldering temperature refers to an iron tip temperature (max. 30 W power) during the solder process. Soldering positions should be 1.6 mm away from the bottom edge of the case. The immersion time must be less than 3 s.

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## Wavelength binning ( $P_{opt} = 3.5\text{ W}$ , $T_A = 25\text{ °C}$ )<sup>Note3</sup>

	WAVELENGTH (NM)						
	440- 442	442- 444	444- 446	446- 448	448- 450	450- 452	452- 455
Bin	1	2	3	4	5	6	7

## Forward current binning ( $P_{opt} = 3.5\text{ W}$ , $T_A = 25\text{ °C}$ )<sup>Note3</sup>

	FORWARD CURRENT (mA)						
	1920- 2000-	2000- 2080	2080- 2160	2160- 2240	2240- 2320	2320- 2400	2400- 2480
Bin	A	B	C	D	E	F	G

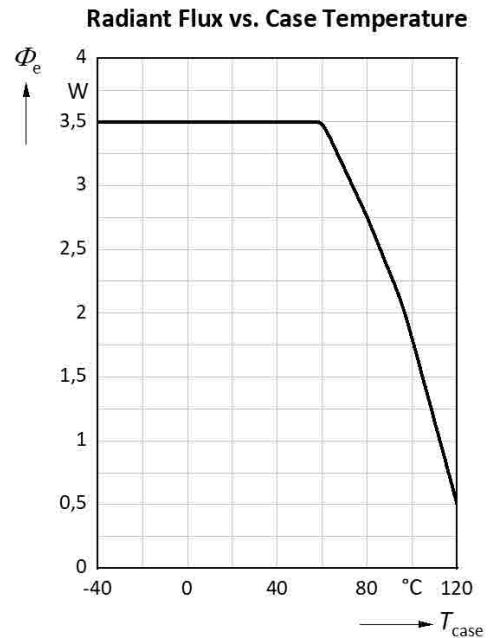
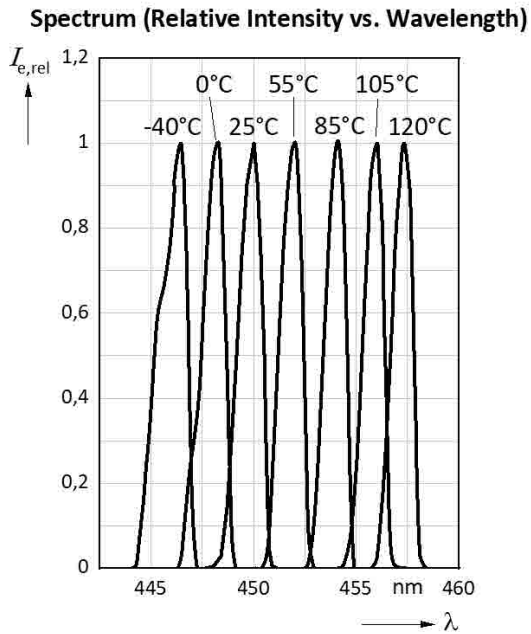
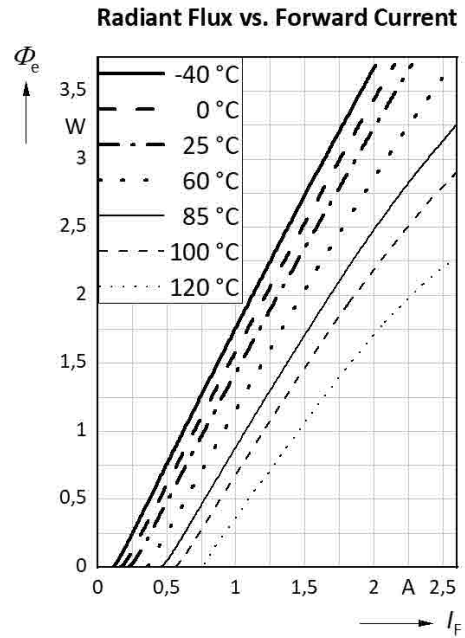
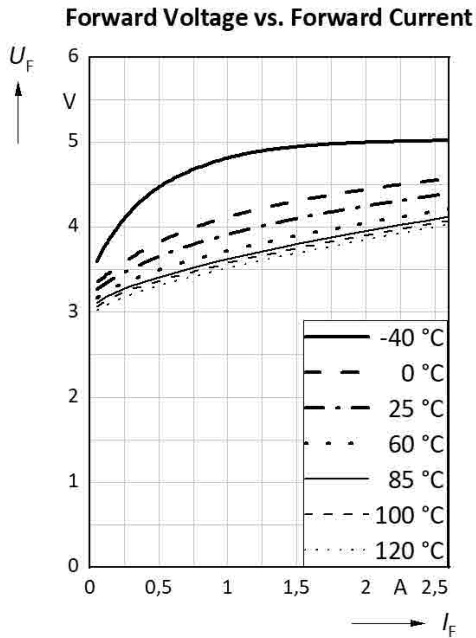
Note3:  $P_{opt}$ ,  $\lambda_{center}$  and  $V_F$  is measured with an internal reproducibility of  $\pm 7\%$ ,  $\pm 0.3\text{ nm}$  and  $\pm 0.05\text{ V}$ , respectively (acc. to GUM with a coverage factor of  $k = 3$ ).

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## Typical characteristics graphs



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## **Caution – Laser radiation!**

Depending on the mode of operation, these devices emit highly concentrated visible and/or invisible (IR) light which can be very hazardous to the human eyes and skin. Avoid eye or skin exposure to direct, scattered radiation or through optical lenses. When operating the lasers wear protective glasses with the appropriate level of protection and ensure compliance with the necessary technical, organizational and personal protective measures in accordance with the currently valid safety regulations of laser products. To ensure safe laser operation please contact your laser protection officer. Products which incorporate these devices have to follow the safety precautions given in IEC 60825-1.

## **Important usage and application information**

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.

These laser diodes are designed as consumer goods in production and quality, especially in the application areas of computers, measuring equipment, tooling machines, audio visual equipment and home appliances. Please do not use this product for equipment, which needs extremely high reliability and safety in function and precision. Operating the laser diode above the maximum rating even for very short periods of time can damage the laser diode or reduce its lifetime. The laser diode must be operated with a suitable power supply with minimized electrical noise. When using this product, please stay within the maximum ratings, pay attention to the other instructions, conditions and precautions described in this datasheet. We will assume no responsibility for any damages resulting from improper use of this product. During operation, heat is generated in the laser chip. Because of this, the case temperature increases. A rising case temperature can shorten the lifetime of the product. Due to this, a sufficient heat sink should be attached to this product when operating.

## **Handling and storage conditions**

The laser diode is very sensitive to electrostatic discharge (ESD). Proper precautions must be taken.

Every person and other equipment (tool, machines) must be continuously ESD protected. Workers should always wear an antistatic wrist strap.

In order not to damage the hermetic seal of the laser, mechanical stress on the window should be avoided. The cap should not be stressed e.g. by tightening hard, or fixing to the application. Moreover, mechanical stress (bending) on the pins can negatively affect the hermetic seal which also influence the long-term stability.

The laser diodes are preferably stored in trays and encased in an antistatic bag under ambient conditions that are dry at normal temperature. Please refer to the "Storage temperature" range in

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the data sheet for more information.

Since dust on the window might influence the optical properties of the products, the work area must be kept clean. For information please contact our nearest sales office.

## **Packing**

Laser diodes are arranged in trays. A cover is put on the top of the tray. For shipment the trays are arranged to stacks and placed into an ESD bag and packaging box. Please use the recycling operators familiar to you. If required you can ask for our help. Please get in touch with your nearest sales office. By agreement we will take packing material back, if sorted. Transport costs of any kind must be paid by customers. For packing material that is returned to us unsorted or which we are not obliged to accept, any costs incurred will be invoiced to you.

## **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.

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## Disclaimer

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

Critical components<sup>3</sup> may only be used in life-support devices<sup>4</sup> or systems with the express written approval by us.

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## Changes

VERSION	DATE	CONTENT
1.0	14.10.2020	Change management has started, technical graphs have been added (page 3).
2.0	18.01.2022	New address.

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<sup>1</sup>Due to the special conditions of the manufacturing processes of lasers, 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>Light Measurements are done with an accuracy of  $\pm 15\%$ . Voltage and wavelength are measured with an accuracy of  $\pm 0.1$  V and  $\pm 1$  nm. Correlation to customer's equipment and products is required.

<sup>3</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>4</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..