NICHIA

Blue Laser Diode

NDHB510APA

■Features

- Wavelength: 445nm
- Optical Output Power: 50mW
- Single Transverse Mode

■Absolute Maximum Ratings

(Tc=25°C)

Item	Symbol	Absolute Maximum Ratings	Unit
Optical Output Power	Po	80	mW
LD Reverse Voltage	Vr (LD)	5	V
PD Reverse Voltage	Vr (PD)	20	V
Storage Temperature	Tstg	-35 ~ 70	°C
Operating Case Temperature	Tc	-10 ~ 60	°C

■Initial Electrical/Optical Characteristics

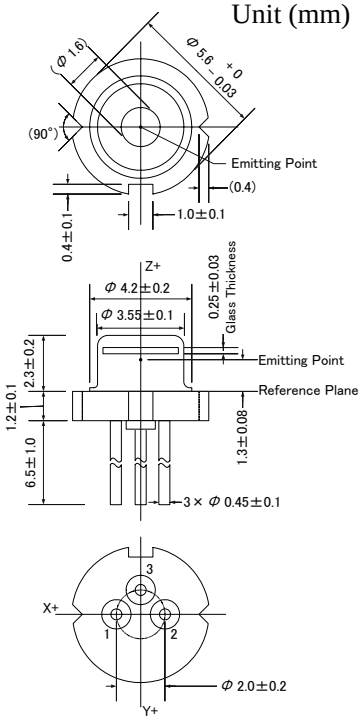
(Tc=25°C)

Item		Condition	Symbol	Min	Typ.	Max	Unit
Optical Output Power		CW	Po	-	-	50	mW
Peak Wavelength		Po=50mW	λp	440	445	450	nm
Threshold Current		CW	Ith	10	35	50	mA
Operating Current		Po=50mW	Iop	80	120	160	mA
Slope Efficiency		CW	η	0.3	0.6	1.0	W/A
Operating Voltage		Po=50mW	Vop	4.5	5.5	6.5	V
FWHM Beam Divergence		Po=50mW	θ//	6.5	8.5	10.5	deg.
			θ⊥	17.0	22.0	29.0	deg.
Emission Point Accuracy	Angle	Po=50mW	Δθ//	-	-	±2.5	deg.
			Δθ⊥	-	-	±7.0	deg.
	Position	-	ΔX, Y, Z	-	-	±80	μm
Monitor Current		Po=50mW	Im	-	-	2.0	mA

All figures in this specification are measured by Nichia's method and may contain measurement deviations.

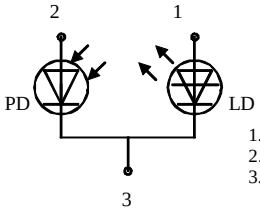
Outline Dimension

Unit (mm)



( ) are reference figures

Pin Connection



1. LD Anode
2. PD Anode
3. Common

This internal photodiode are solely Nichia's internal evaluation purpose only, and Nichia gives no warranty to Monitor Current.

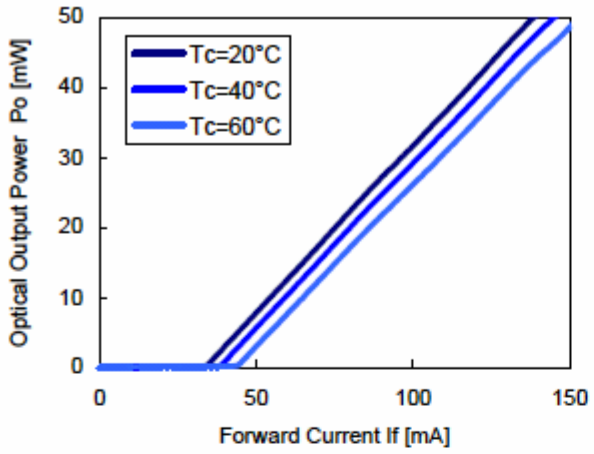
The above specifications are for reference purpose only and subjected to change without prior notice.

NICHIA CORPORATION
http://www.nichia.co.jp

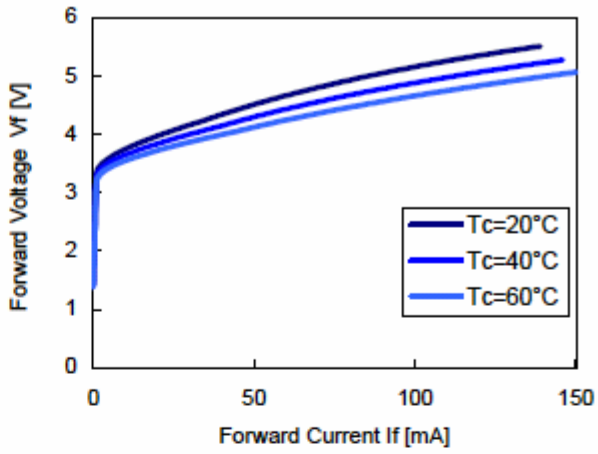
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■Typical Characteristics

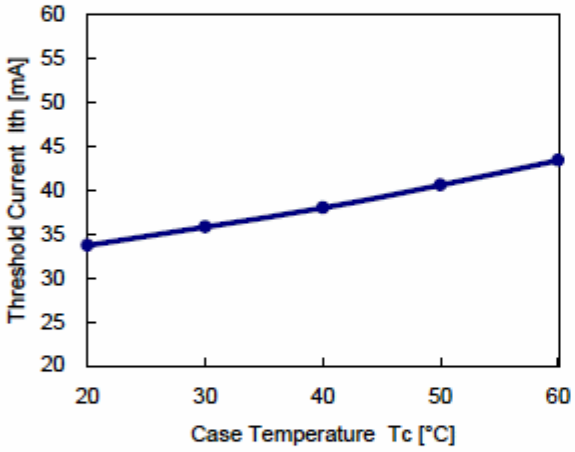
◆Optical Output Power vs. Forward Current



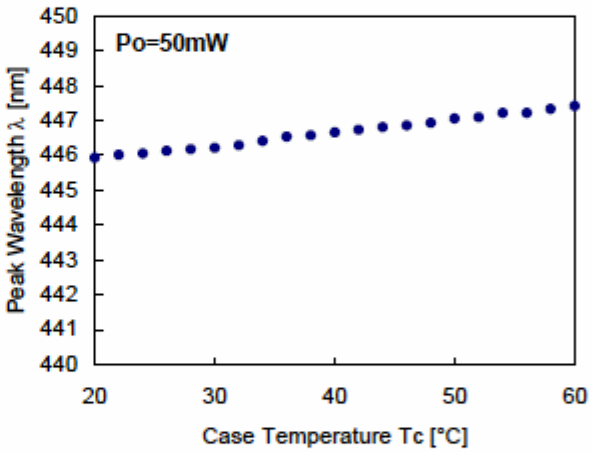
◆Forward Voltage vs. Forward Current



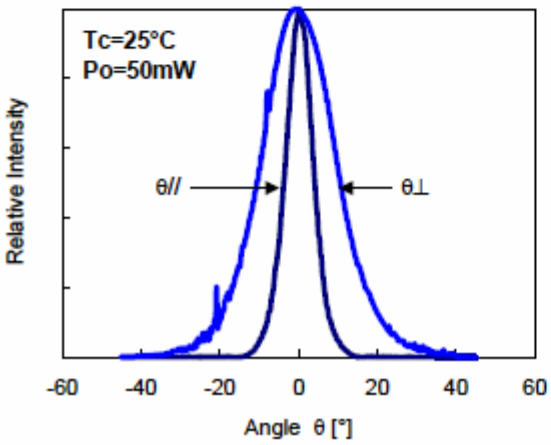
◆Threshold Current vs. Case Temperature



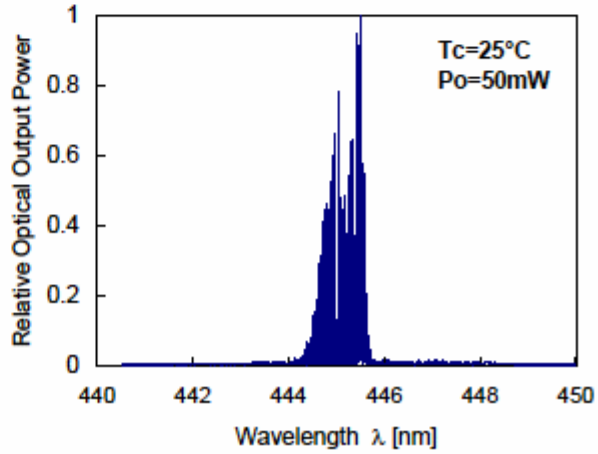
◆Peak Wavelength vs. Case Temperature



◆Far Field Pattern



◆Typical Spectrum



■Cautions

(1) Safety of Laser light

- **Laser beam are extremely dangerous to human eyes.** Never look at laser beam directly and/or through optical lens. When handling the LDs, wear appropriate safety glasses to prevent laser light, even any reflections from entering to the eye. **Focused laser beam through optical instruments will increase the chance of eye hazard.**
- Nichia LDs are classified in **Class 3B of IEC60825-1 and 21 CFR Part 1040.10 Safety Standards**. It is absolutely necessary to take overall safety measures against User's modules, equipment and systems into which Nichia LDs are incorporated and/or integrated.



(2) Operating method

- The LD shall change its forward voltage requirement and optical output power according to temperature change. Also, the LD will require more operation current to maintain same output power as it degrades. In order to maintain output power, use of APC (Automatic Power Control) is recommended, which use monitor feedback to adjust the operation current.
- Confirm that electrical spike current generated by switching on and off does not exceed the maximum operating current level specified herein above as absolute max rating. Also, employ appropriate countermeasures to reduce chattering and/or overshooting in the Circuit.

(3) Static Electricity

- Static electricity or electrical surges will reduce and degrade the reliability of the LDs. It is recommended to use a wrist strap or anti-electrostatic glove when handling the Product.

(4) Absolute Maximum Rating

- Active layer of LDs shall have high current density and generate high electric field during its operation. In order to prevent excessive damage, the LD must be operated strictly below Absolute Max Rating.

(5) Others

- Nichia LDs described in this brochure are intended to be used for ordinary electronic equipment (such as office equipment, communications equipment, measurement instruments and household appliances). Consult Nichia's sales staff in advance for information on the applications in which exceptional quality and reliability are required, particularly when the failure or malfunction of the LDs may directly jeopardize life or health (such as for airplanes, aerospace, submersible repeaters, nuclear reactor control systems, automobiles, traffic control equipment, life support systems and safety devices).
- The Purchaser must acknowledge that any LD can be failed statically and must design its equipments fail safe design. Prior to use of the LD, please confirm that the LD, as described in Nichia's specifications, meets the life expectancy needs of, and provides the features required by the Circuit and any related modules, equipment and/or systems.
- Nichia prohibit Purchaser from reverse engineering, disassembling, or taking any other steps to derive the structure or design of the LD.
- The appearance and specifications of the product may be modified for improvement without notice. The formal specifications must be exchanged and signed by both parties before large volume purchase begins.
- No unauthorized transmission or reproduction of this document, either in whole or in part, is permitted.