NV4V41SF

Data Sheet

Blue-Violet Laser Diode

405 nm Blue-Violet Laser Light Source

R08DS0064EJ0200
Rev.2.00
Jun 20, 2013

DESCRIPTION

The NV4V41SF is a high output blue-violet laser diode with a wavelength of 405 nm. A newly developed LD chip structure achieves a high optical power output of 600 mW (CW).

FEATURES

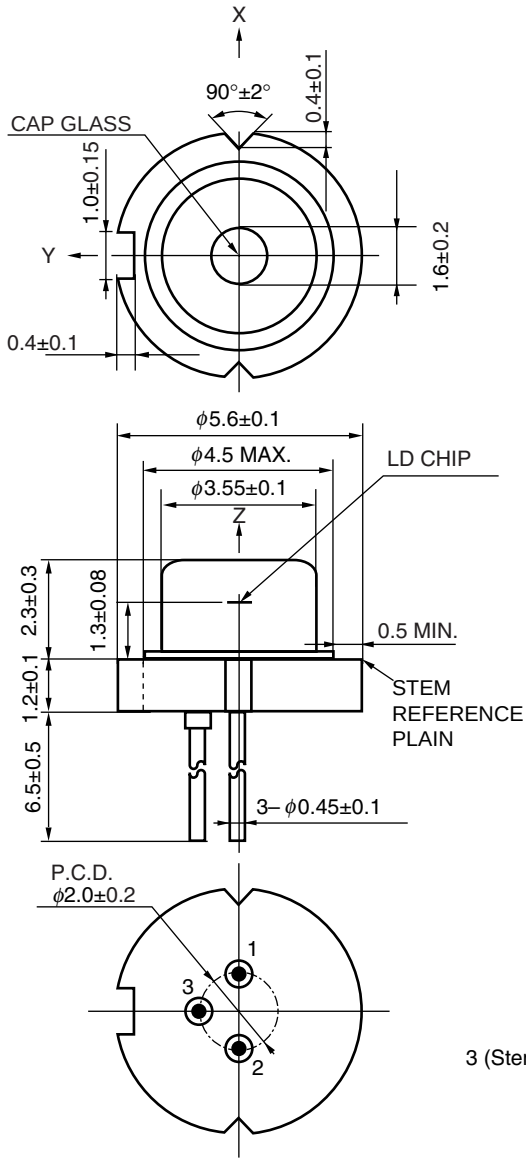
- High optical output power P_o = 600 mW @CW
- Peak wavelength λ_p = 400 to 405 nm
- Multi transverse mode (lateral)
- Operating temperature range T_C = 0 to +30°C
- ϕ5.6 mm CAN package

APPLICATIONS

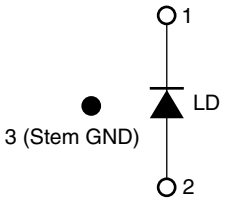
- Blue-violet laser light source
- Light source for Laser Direct Imaging system
- Light source for industrial manufacturing equipment

The mark <R> shows major revised points.
The revised points can be easily searched by copying an "<R>" in the PDF file and specifying it in the "Find what:" field.

<R> PACKAGE DIMENSIONS (UNIT: mm)



BOTTOM VIEW



PIN CONNECTIONS

Remark Cap glass thickness : 0.25±0.03 mm
Cap glass refractive index : 1.53 (λ = 405 nm)

<R> ORDERING INFORMATION

Part Number	Order Number	Rank	Packing Style
NV4V41SF	NV4V41SF-A	HV	Tray Packing (100 p/Tray), With data
		XV	Individual Packing (for samples), With data

ABSOLUTE MAXIMUM RATINGS (T_C = 25°C, unless otherwise specified)

Parameter	Symbol	Ratings	Unit
Optical Output Power (CW)	P_o	700	mW
Reverse Voltage of LD	V_R	2	V
Operating Case Temperature	T_C	0 to +30	°C
Storage Temperature	T_{stg}	–40 to +85	°C

RECOMMENDED OPERATING CONDITIONS (T_C = 25°C, unless otherwise specified)

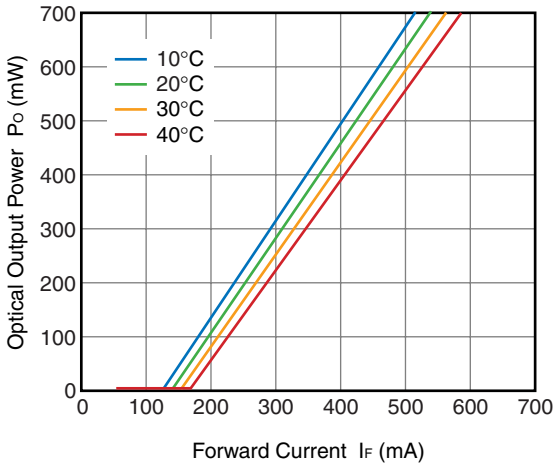
Parameter	Symbol	MAX.	Unit
Optical Output Power (CW)	P_o	600	mW

ELECTRO-OPTICAL CHARACTERISTICS (T_C = 25°C, unless otherwise specified)

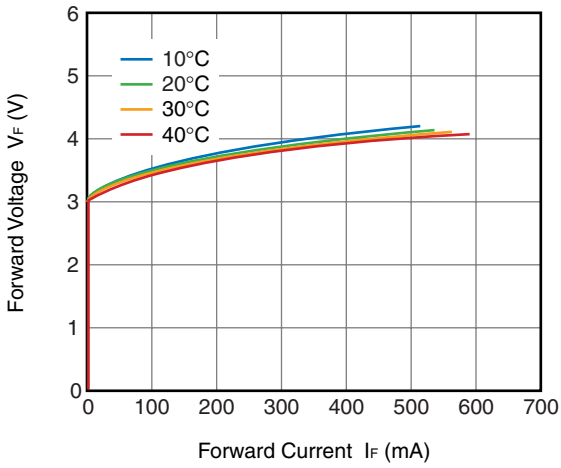
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Threshold Current	I_{th}	CW		140	180	mA
Operating Current	I_{op}	CW, P_o = 600 mW		500	600	mA
Operating Voltage	V_{op}	CW, P_o = 600 mW		4.1	4.6	V
Slope Efficiency	η_d	CW, P_o = 100 mW, 600 mW	1.0	1.7		W/A
Peak Wavelength	λ_p	CW, P_o = 600 mW	400	–	405	nm
Beam Divergence (lateral)	$\theta_{//}$	CW, P_o = 600 mW ($1/e^2$)	10	16	22	deg.
Beam Divergence (vertical)	$\theta_{\perp}$		35	40	50	
Position Accuracy Angle (vertical)	$\Delta\theta_{\perp}$	CW, P_o = 600 mW	–5	–	5	deg.

TYPICAL CHARACTERISTICS (T_C = 25°C, unless otherwise specified)

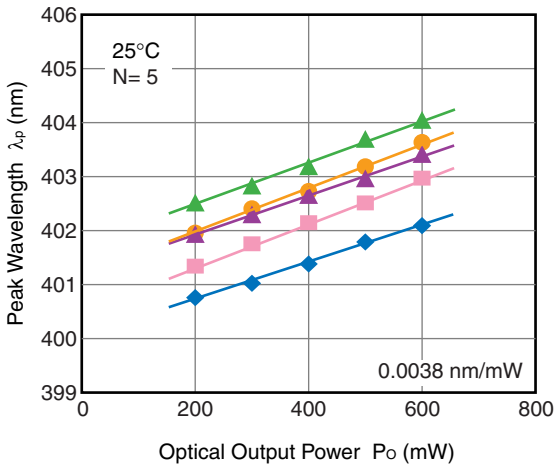
OPTICAL OUTPUT POWER vs. FORWARD CURRENT



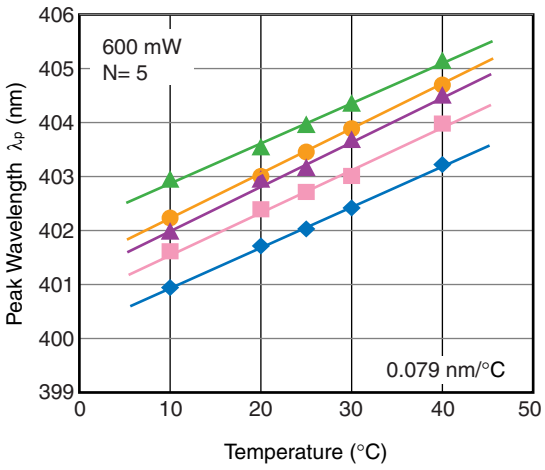
FORWARD VOLTAGE vs. FORWARD CURRENT



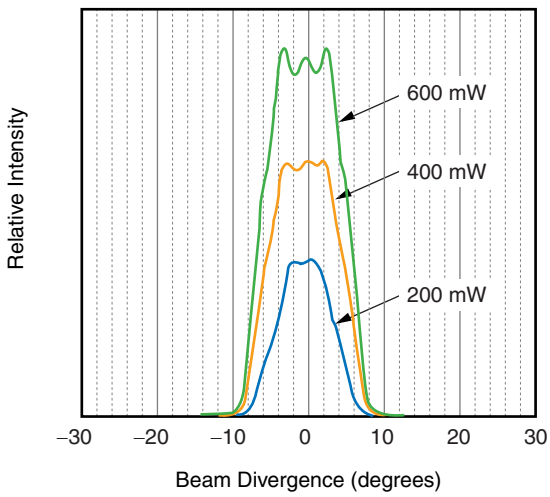
POWER DEPENDENCE OF PEAK WAVELENGTH



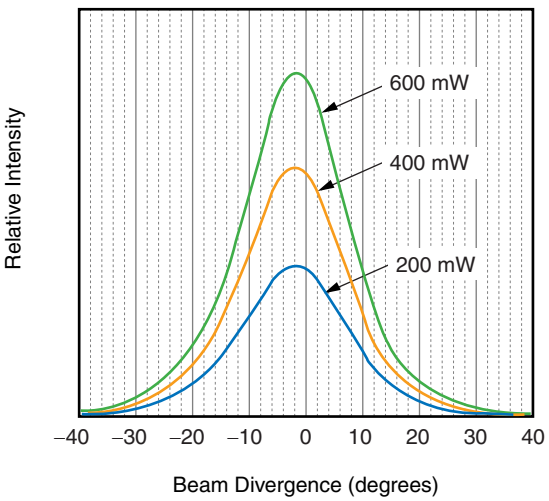
TEMPERATURE DEPENDENCE OF PEAK WAVELENGTH



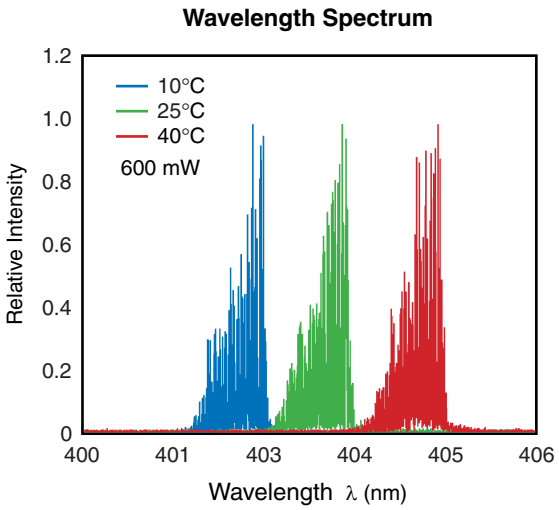
FFP (LATERAL)



FFP (VERTICAL)



Remark The graphs indicate nominal characteristics.



Remark The graphs indicate nominal characteristics.

NOTES ON HANDLING (UNIT: mm)

1. Recommended soldering conditions
   - Peak Temperature ≤ 350°C
   - Time ≤ 3 seconds
   - Soldering of leads should be made at the point 2.0 mm from the root of the lead
   - This device cannot be mounted using reflow soldering.

2. Usage cautions
   (1) Take the following steps to ensure that the device is not damaged by static electricity.
   - Wear an antistatic wrist strap when soldering the device.
     We recommend a strap with a 1 MΩ resistor.
   - Make sure that the work table and soldering iron are grounded.
   - Make sure that the soldering iron does not leak.

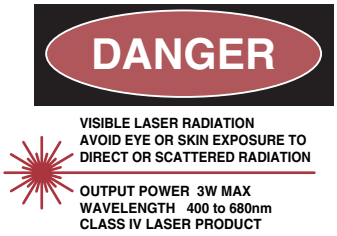
   (2) Do not subject the package to undue stress.
   The package has a tensile strength of 1N or less.
   Do not exceed this rating. Also, avoid bending the leads as much as possible.
   If the leads must be bent, bend them only once, making sure to anchor the stem base of the lead.

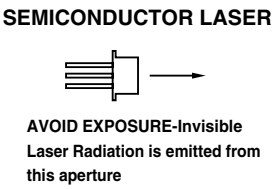
   (3) Do not allow the cap glass of the package to become scratched or dirty.
   Also, do not subject the cap glass to external force.

   (4) Be sure to attach a heat sink to sufficiently dissipate heat.

   (5) Use the device as soon as possible after opening the bag.

SAFETY INFORMATION ON THIS PRODUCT





Warning Laser Beam	A laser beam is emitted from this diode during operation. If the laser beam or its reflection enters your eye, it may cause injury to the eye or loss of eyesight. (Note that, depending on the wavelength of the beam, the laser beam might not be visible.) • Do not look directly into the laser beam. • Avoid exposure to the laser beam, any reflected or collimated beam.

Revision History	NV4V41SF Data Sheet

Rev.	Date	Description	
		Page	Summary
0.01	Jul 11, 2012	–	First edition issued
1.00	Jan 09, 2013	Throughout	This data sheet is officially released (Preliminary Data Sheet becomes Data Sheet).
		p.3	The typical values of Threshold Current and Operating Voltage are changed in ELECTRO-OPTICAL CHARACTERISTICS.
			The unit, "$(1/e^2)$", is deleted from the value of P_O.
		pp.4,5	TYPICAL CHARACTERISTICS is added.
2.00	Jun 20, 2013	p.2	Modification of **PACKAGE DIMENSIONS**
		p.3	Modification of **ORDERING INFORMATION**

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