

NV4V31SF

Data Sheet

Blue-Violet Laser Diode

R08DS0070EJ0100

405 nm Blue-Violet Laser Light Source

Rev.1.00

Jun 20, 2013

DESCRIPTION

The NV4V31SF is a blue-violet laser diode with a wavelength of 405 nm. A newly developed LD chip structure achieves a high optical power output of 175 mW (CW). The NV4V31SF can provide excellent linearity from low to high output at high temperatures, and reduces the unevenness of beam divergence.

FEATURES

- High optical output power $P_o = 175 \text{ mW @CW}$
- Peak wavelength $\lambda_p = 405 \text{ nm TYP.}$
- Single transverse mode (lateral)
- Wide operating temperature range $T_C = -5 \text{ to } +85^\circ\text{C}$
- $\phi 5.6 \text{ mm CAN package}$

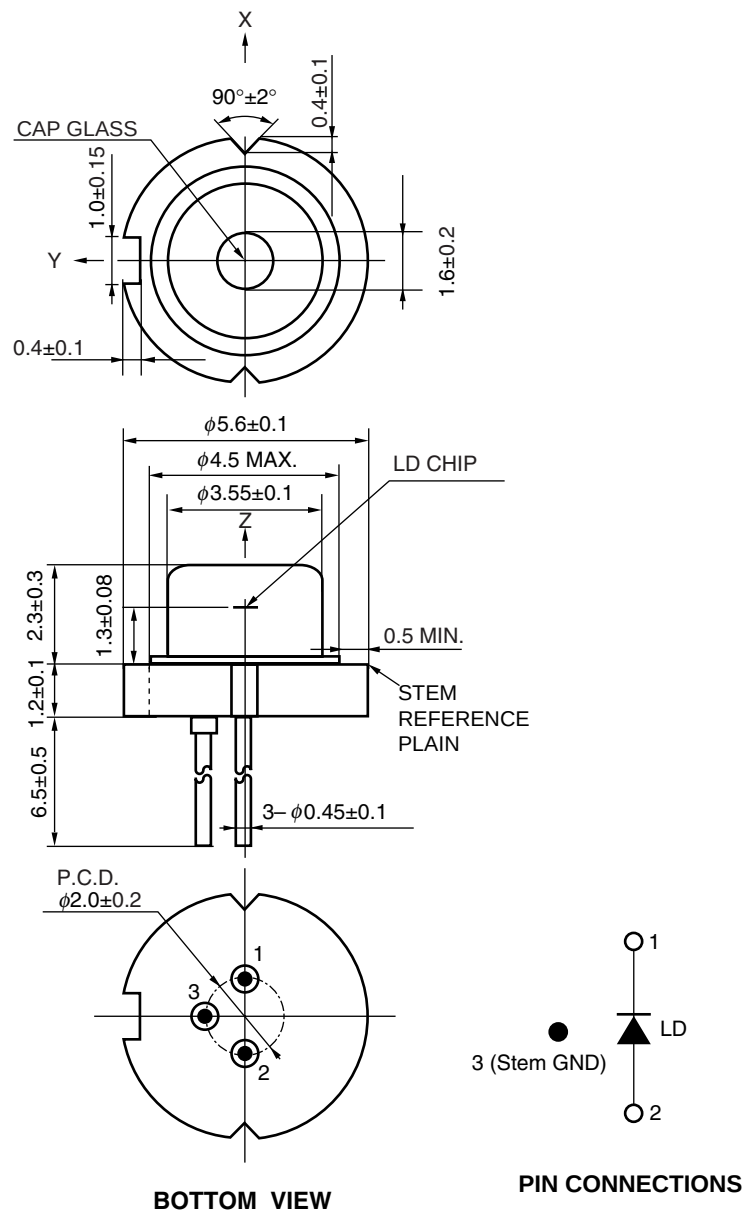
APPLICATIONS

- Blue-violet laser light source



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.

NV4V31SF<R> **PACKAGE DIMENSIONS (UNIT: mm)**

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

NV4V31SF<R> **ORDERING INFORMATION**

Part Number	Order Number	Rank	Packing Style
NV4V31SF	NV4V31SF-A	HV	Tray Packing (100 p/Tray), With data
		XV	Individual Packing (for samples), With data

ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	Ratings	Unit
Optical Output Power (CW)	P_o	210	mW
Reverse Voltage of LD	V_R	2	V
Operating Case Temperature	T_C	-5 to +85	$^\circ\text{C}$
Storage Temperature	T_{stg}	-40 to +85	$^\circ\text{C}$

**RECOMMENDED OPERATING CONDITIONS
($T_C = 25^\circ\text{C}$, unless otherwise specified)**

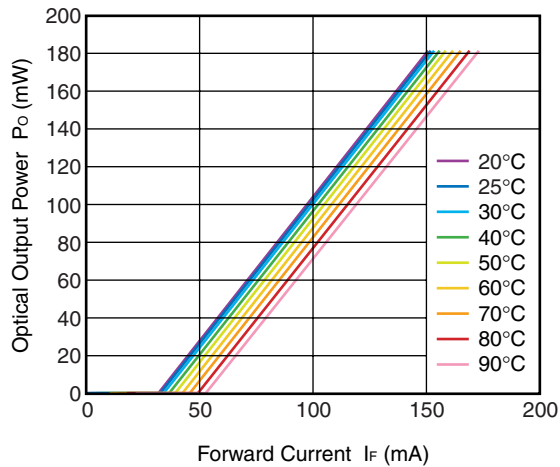
Parameter	Symbol	MAX.	Unit
Optical Output Power (CW)	P_o	175	mW

**ELECTRO-OPTICAL CHARACTERISTICS
($T_C = 25^\circ\text{C}$, unless otherwise specified)**

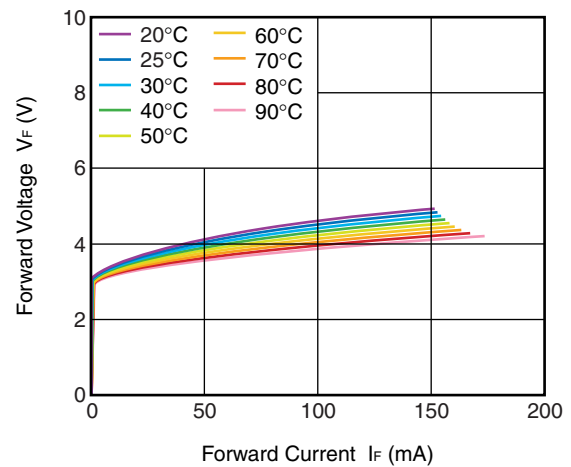
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Threshold Current	I_{th}	CW		35	55	mA
Operating Current	I_{op}	CW, $P_o = 175$ mW		150	200	mA
Operating Voltage	V_{op}	CW, $P_o = 175$ mW		5.0	6.5	V
Slope Efficiency	η_d	CW, $P_o = 20$ mW, 175 mW	1.1	1.55		W/A
Peak Wavelength	λ_p	CW, $P_o = 175$ mW	400	405	410	nm
Beam Divergence (lateral)	θ_l	CW, $P_o = 175$ mW	6	9	12	deg.
Beam Divergence (vertical)	$\theta_\perp$		15	20	25	
Position Accuracy Angle (lateral)	$\Delta\theta_l$	CW, $P_o = 175$ mW	-3	0	3	deg.
Position Accuracy Angle (vertical)	$\Delta\theta_\perp$		-3	0	3	

TYPICAL CHARACTERISTICS ($T_c = 25^\circ\text{C}$, unless otherwise specified)

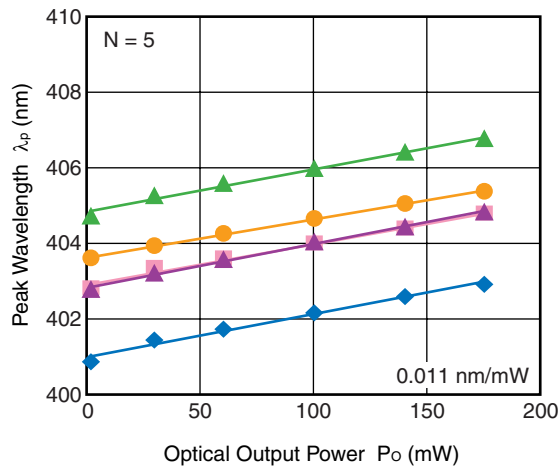
OPTICAL OUTPUT POWER
vs. FORWARD CURRENT



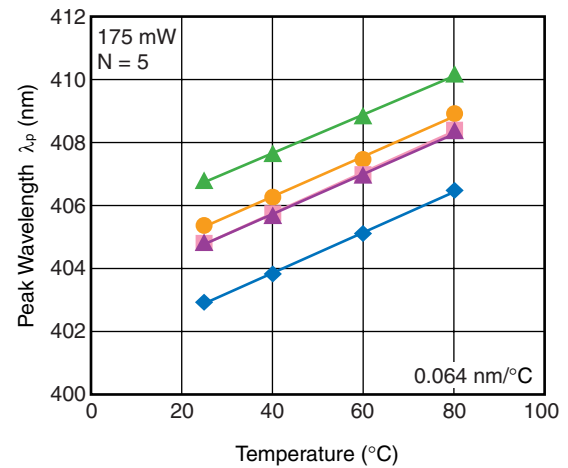
FORWARD VOLTAGE vs.
FORWARD CURRENT



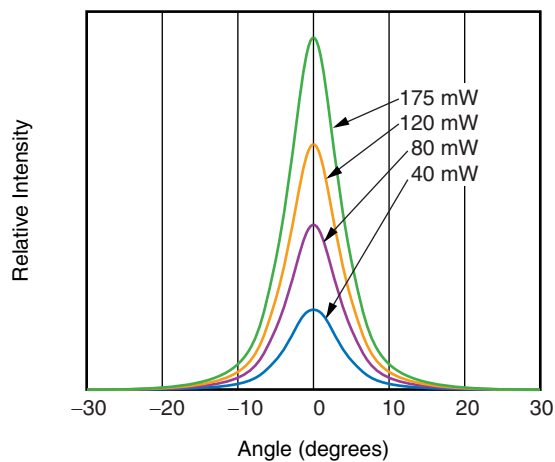
POWER DEPENDENCE OF
PEAK WAVELENGTH



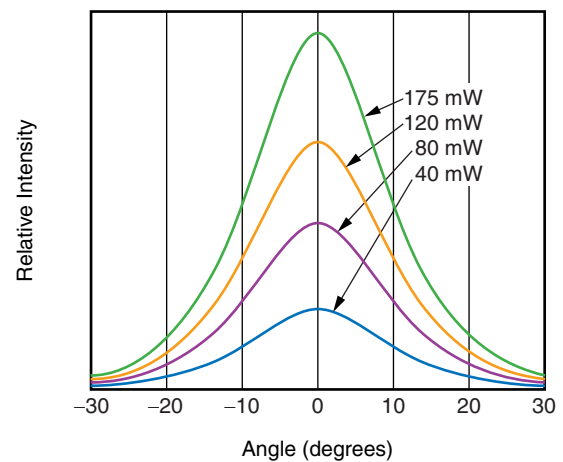
TEMPERATURE DEPENDENCE OF
PEAK WAVELENGTH



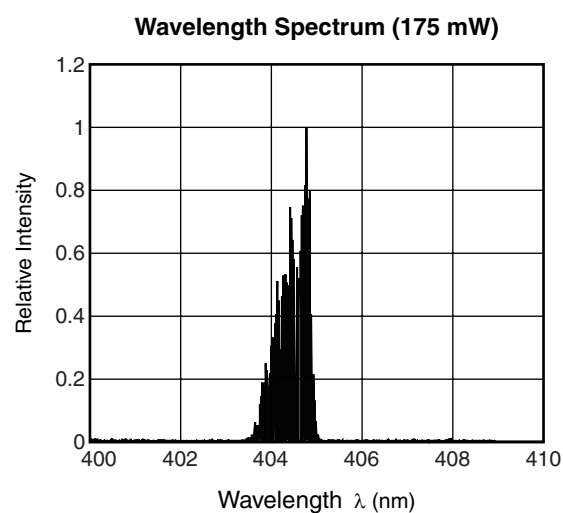
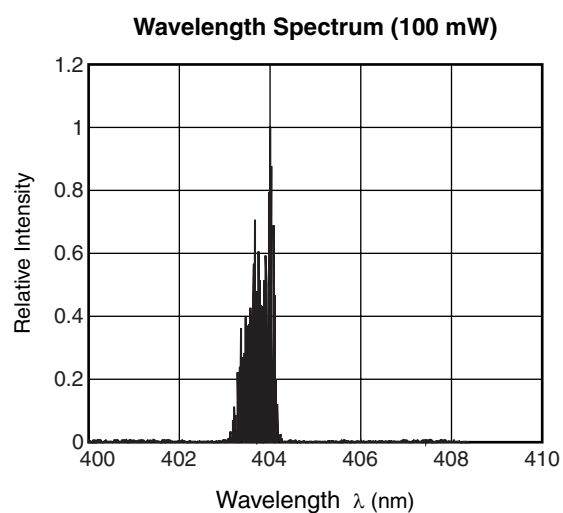
FFP (LATERAL)



FFP (VERTICAL)



Remark The graphs indicate nominal characteristics.



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NOTES ON HANDLING

1. Recommended soldering conditions
 - Peak Temperature $\leq 350^{\circ}\text{C}$
 - 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 M Ω 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

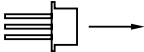
DANGER



VISIBLE LASER RADIATION
AVOID EYE OR SKIN EXPOSURE TO
DIRECT OR SCATTERED RADIATION

OUTPUT POWER 3W MAX
WAVELENGTH 400 to 680nm
CLASS IIIb LASER PRODUCT

SEMICONDUCTOR LASER



AVOID EXPOSURE-Invisible
Laser Radiation is emitted from
this aperture

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.
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Revision History	NV4V31SF Data Sheet
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Rev.	Date	Description	
		Page	Summary
0.01	Jan 23, 2013	–	First edition issued
1.00	Jun 20, 2013	p.2	Modification of PACKAGE DIMENSIONS
		p.3	Modification of ORDERING INFORMATION

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