

NV4V31SF

Blue-Violet Laser Diode

405 nm Blue-Violet Laser Light Source

R08DS0070EJ0200

Rev.2.00

Aug 28, 2020

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

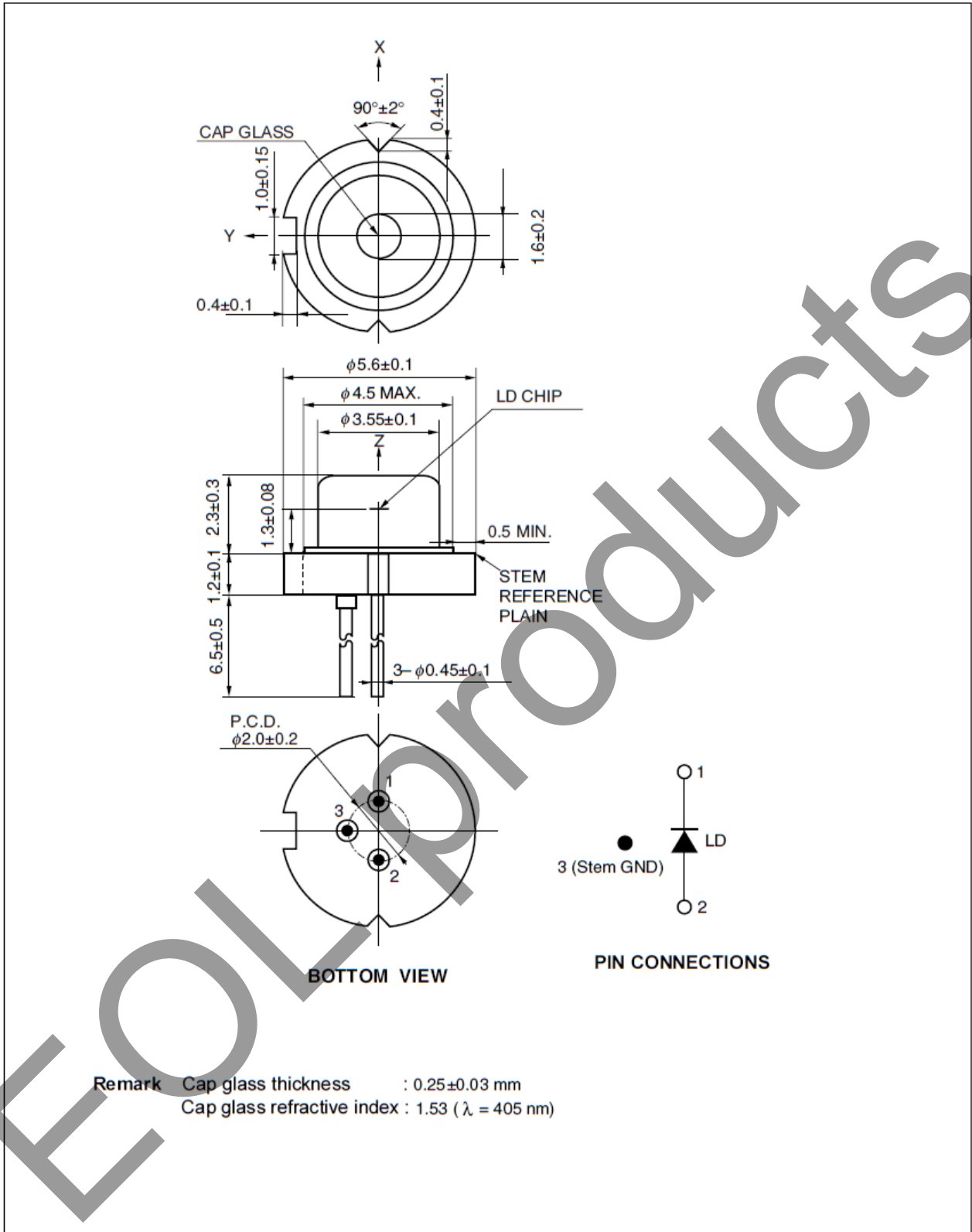
- Blue-violet laser light source



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.

PACKAGE DIMENSIONS (UNIT: mm)



<R> ORDERING INFORMATION

Part Number	Order Number	Rank	Packing Style
NV4V31SF	NV4V31SF-A	HV	Tray Packing (100 p/Tray), With data
	NV4V31SF-SA-A	XV	Individual Packing (for samples), With data
	NV4V32SF-A	LV	Tray Packing (100 p/Tray), Without data
	NV4V32SF-SA-A	KV	Individual Packing (for samples), Without data

ABSOLUTE MAXIMUM RATINGS (T_c = 25°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	°C
Storage Temperature	T _{stg}	-40 to +85	°C

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

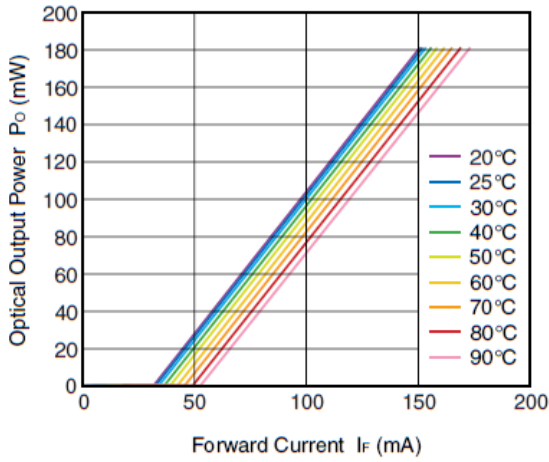
Parameter	Symbol	MAX.	Unit
Optical Output Power (CW)	P _o	175	mW

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

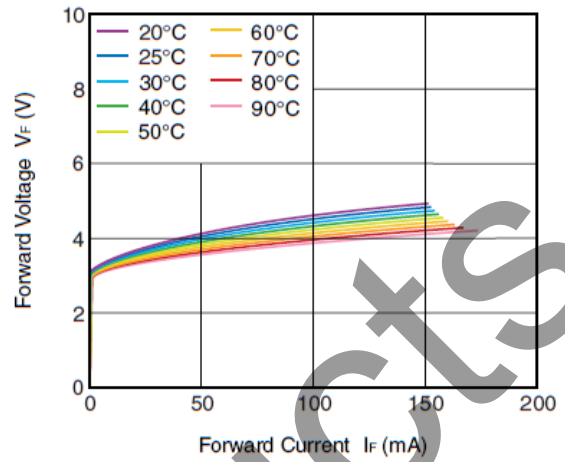
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Threshold Current	I _{th}	CW		35	55	mA
Operating Current	I _{op}	CW, P _o = 175 mW		150	200	mA
Operating Voltage	V _{op}	CW, P _o = 175 mW		5.0	6.5	V
Slope Efficiency	η _d	CW, P _o = 20 mW, 175 mW	1.1	1.55		W/A
Peak Wavelength	λ _p	CW, P _o = 175 mW	400	405	410	nm
Beam Divergence (lateral)	θ _h	CW, P _o = 175 mW	6	9	12	deg.
Beam Divergence (vertical)	θ _v		15	20	25	
Position Accuracy Angle (lateral)	Δθ _h	CW, P _o = 175 mW	-3	0	3	deg.
Position Accuracy Angle (vertical)	Δθ _v		-3	0	3	

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

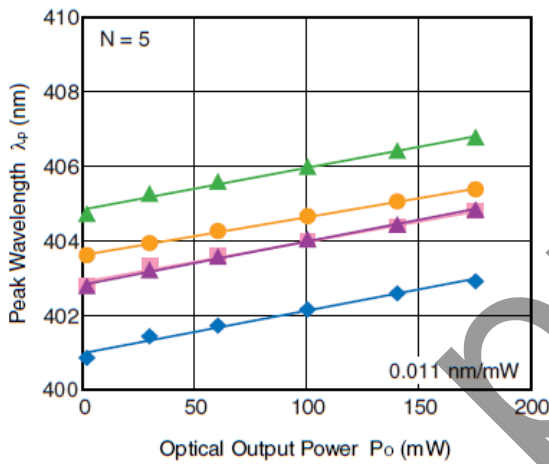
OPTICAL OUTPUT POWER vs. FORWARD CURRENT



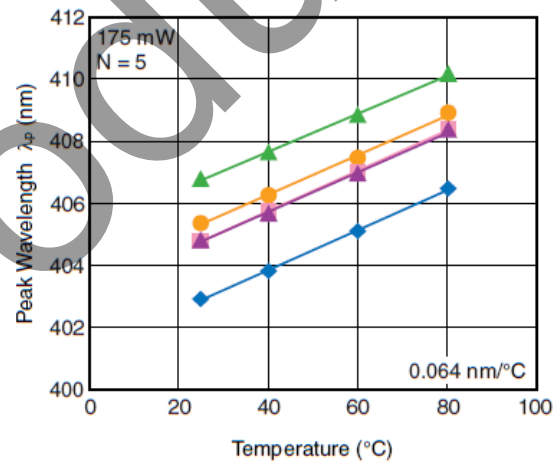
FORWARD VOLTAGE vs. FORWARD CURRENT



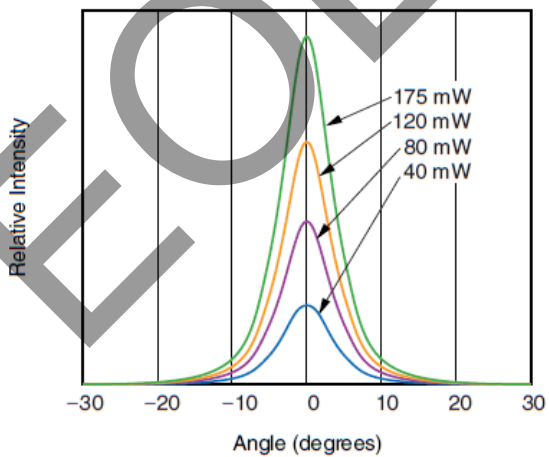
POWER DEPENDENCE OF PEAK WAVELENGTH



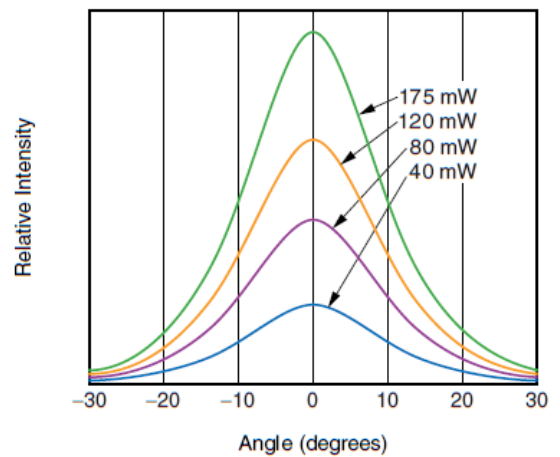
TEMPERATURE DEPENDENCE OF PEAK WAVELENGTH



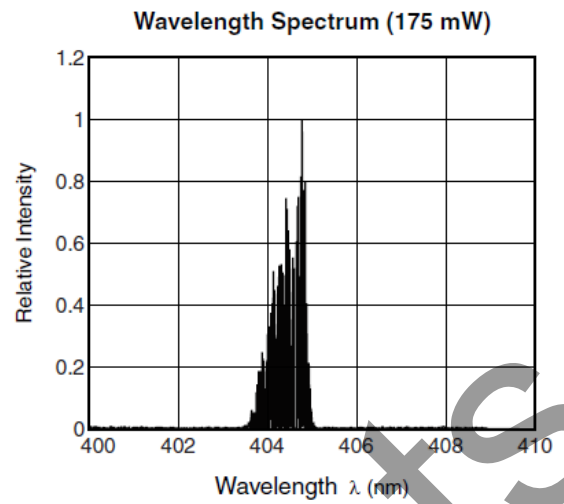
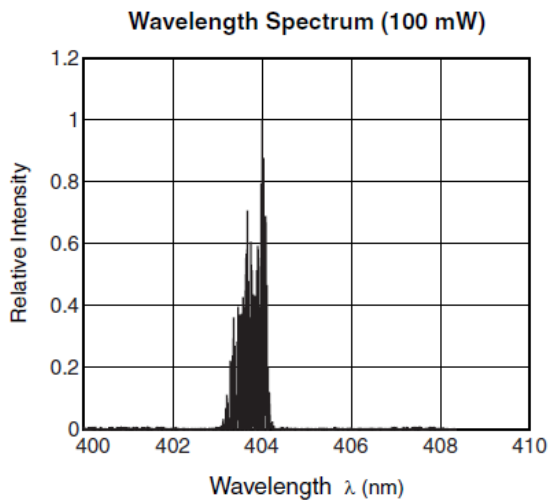
FFP (LATERAL)



FFP (VERTICAL)



Remark The graphs indicate nominal characteristics.



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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

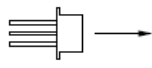


VISIBLE LASER RADIATION
AVOID EYE OR SKIN EXPOSURE TO
DIRECT OR SCATTERED RADIATION



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	<p>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.)</p> <ul style="list-style-type: none"> • 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
2.00	Aug 28,2020	p.3	Modification of ORDERING INFORMATION (Newly established NV4V31SF-SA-A, NV4V32SF-SA-A) (Added NV4V32SF-A)

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