

# NV4V41SF

## Data Sheet

Blue-Violet Laser Diode

R08DS0064EJ0200

405 nm Blue-Violet Laser Light Source

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  $P_o = 600 \text{ mW @CW}$
- Peak wavelength  $\lambda_p = 400 \text{ to } 405 \text{ nm}$
- Multi transverse mode (lateral)
- Operating temperature range  $T_C = 0 \text{ to } +30^\circ\text{C}$
- $\phi 5.6 \text{ mm}$  CAN package

### APPLICATIONS

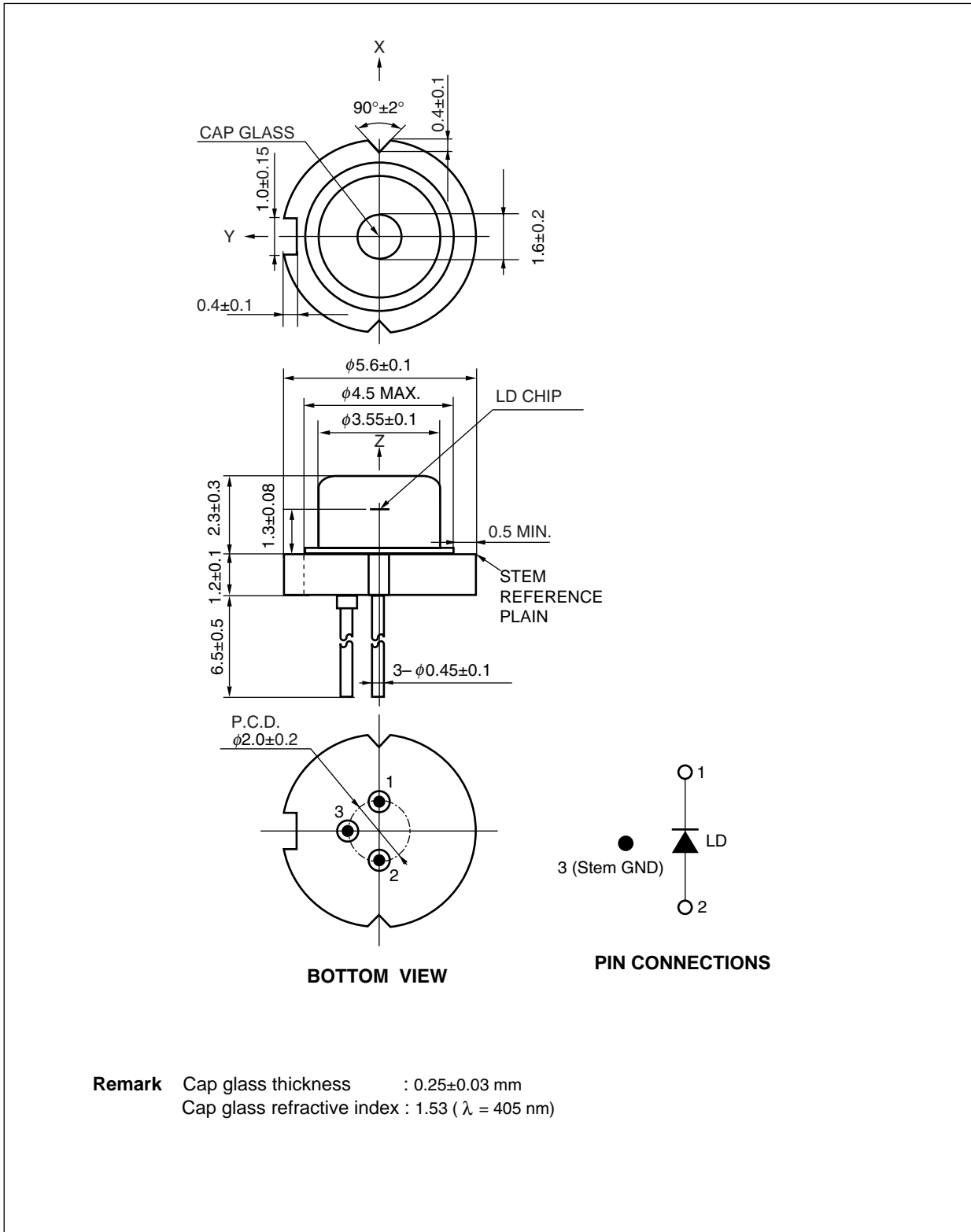
- Blue-violet laser light source
- Light source for Laser Direct Imaging system
- Light source for industrial manufacturing equipment



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)**



**NV4V41SF**<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<sub>C</sub> = 25°C, unless otherwise specified)**

| Parameter                  | Symbol           | Ratings    | Unit |
|----------------------------|------------------|------------|------|
| Optical Output Power (CW)  | P <sub>o</sub>   | 700        | mW   |
| Reverse Voltage of LD      | V <sub>R</sub>   | 2          | V    |
| Operating Case Temperature | T <sub>C</sub>   | 0 to +30   | °C   |
| Storage Temperature        | T <sub>stg</sub> | -40 to +85 | °C   |

**RECOMMENDED OPERATING CONDITIONS  
(T<sub>C</sub> = 25°C, unless otherwise specified)**

| Parameter                 | Symbol         | MAX. | Unit |
|---------------------------|----------------|------|------|
| Optical Output Power (CW) | P <sub>o</sub> | 600  | mW   |

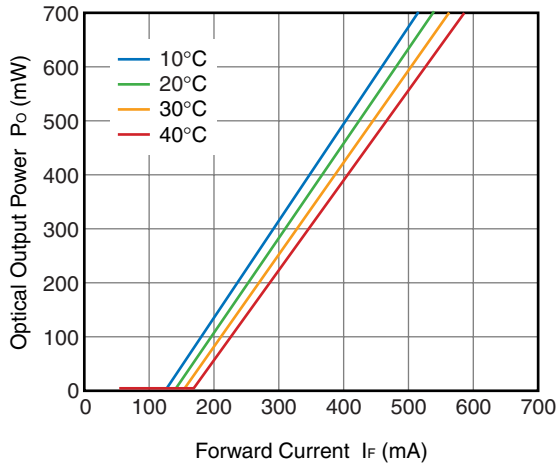
**ELECTRO-OPTICAL CHARACTERISTICS  
(T<sub>C</sub> = 25°C, unless otherwise specified)**

| Parameter                          | Symbol          | Conditions                                      | MIN. | TYP. | MAX. | Unit |
|------------------------------------|-----------------|---|------|------|------|------|
| Threshold Current                  | I <sub>th</sub> | CW  |      | 140  | 180  | mA   |
| Operating Current                  | I <sub>op</sub> | CW, P <sub>o</sub> = 600 mW                     |      | 500  | 600  | mA   |
| Operating Voltage                  | V <sub>op</sub> | CW, P <sub>o</sub> = 600 mW                     |      | 4.1  | 4.6  | V    |
| Slope Efficiency                   | η <sub>d</sub>  | CW, P <sub>o</sub> = 100 mW, 600 mW             | 1.0  | 1.7  |      | W/A  |
| Peak Wavelength                    | λ <sub>p</sub>  | CW, P <sub>o</sub> = 600 mW                     | 400  | –    | 405  | nm   |
| Beam Divergence (lateral)          | θ <sub>l</sub>  | CW, P <sub>o</sub> = 600 mW (1/e <sup>2</sup> ) | 10   | 16   | 22   | deg. |
| Beam Divergence (vertical)         | θ <sub>v</sub>  |   | 35   | 40   | 50   |      |
| Position Accuracy Angle (vertical) | Δθ <sub>v</sub> | CW, P <sub>o</sub> = 600 mW                     | -5   | –    | 5    | deg. |

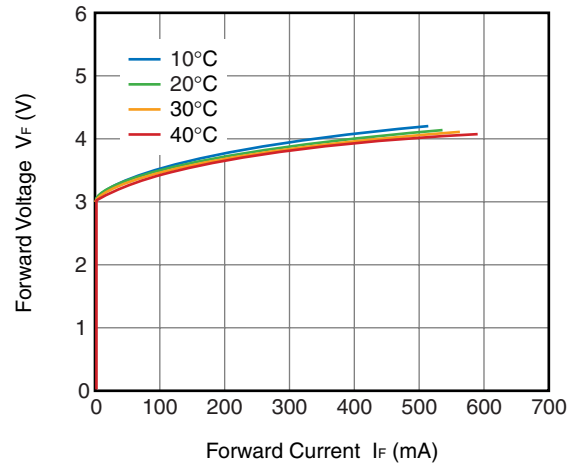
**NV4V41SF**

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

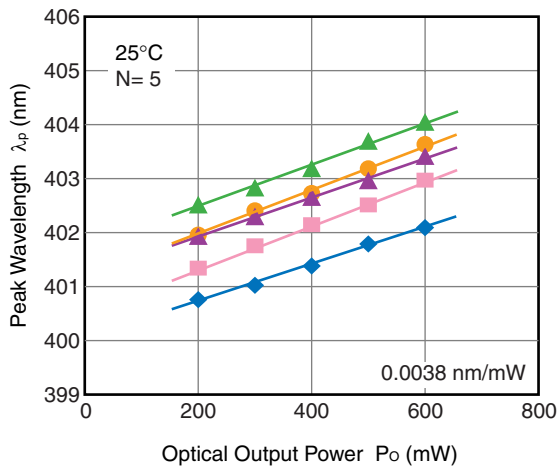
**OPTICAL OUTPUT POWER vs. FORWARD CURRENT**



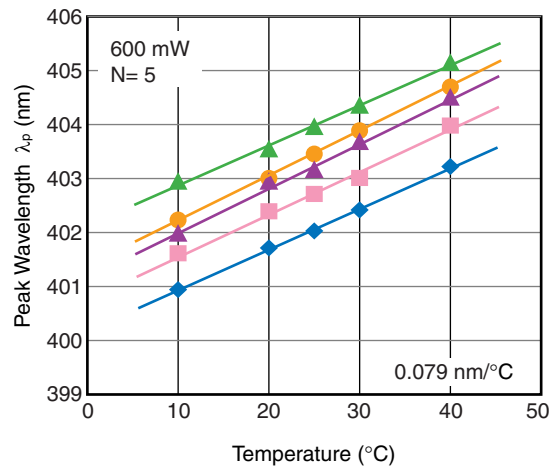
**FORWARD VOLTAGE vs. FORWARD CURRENT**



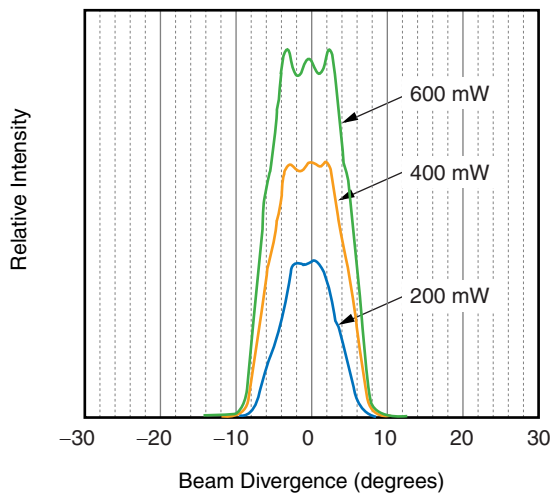
**POWER DEPENDENCE OF PEAK WAVELENGTH**



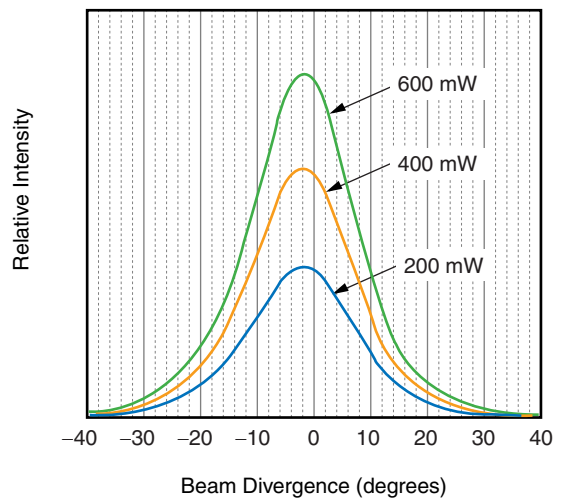
**TEMPERATURE DEPENDENCE OF PEAK WAVELENGTH**



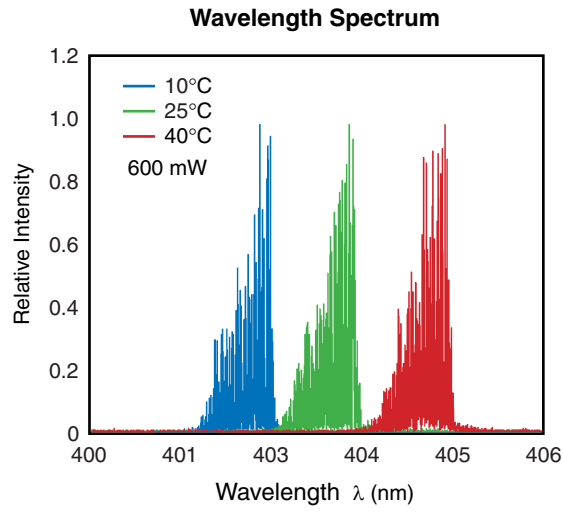
**FFP (LATERAL)**



**FFP (VERTICAL)**



**Remark** The graphs indicate nominal characteristics.



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**NOTES ON HANDLING (UNIT: mm)**

## 1. Recommended soldering conditions

- Peak Temperature        $\leq 350^{\circ}\text{C}$
- Time                        $\leq 3$  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 $\Omega$  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.

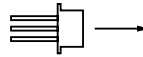
**SAFETY INFORMATION ON THIS PRODUCT**



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

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

**SEMICONDUCTOR LASER**



**AVOID EXPOSURE-Invisible**  
 Laser Radiation is emitted from  
 this aperture

|                |            |   |
|----------------|------------|---|
| <b>Warning</b> | Laser Beam | <p>A laser beam is emitted from this diode during operation.<br/>                 If the laser beam or its reflection enters your eye, it may cause injury to the eye or loss of eyesight.<br/>                 (Note that, depending on the wavelength of the beam, the laser beam might not be visible.)</p> <ul style="list-style-type: none"> <li>• Do not look directly into the laser beam.</li> <li>• Avoid exposure to the laser beam, any reflected or collimated beam.</li> </ul> |
|----------------|------------|---|

|                         |                            |
|-------------------------|----------------------------|
| <b>Revision History</b> | <b>NV4V41SF Data Sheet</b> |
|-------------------------|----------------------------|

| 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.<br>The unit, “(1/e <sup>2</sup> )”, is deleted from the value of P <sub>O</sub> . |
|      |              | pp.4,5      | TYPICAL CHARACTERISTICS is added.   |
| 2.00 | Jun 20, 2013 | p.2         | Modification of <b>PACKAGE DIMENSIONS</b>   |
|      |              | p.3         | Modification of <b>ORDERING INFORMATION</b>   |

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