

To our customers,

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## Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: <http://www.renesas.com>

April 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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VISIBLE LASER DIODE  
**NDL3321ST, NDL3321SU**

5 mW, 650 nm AlGaInP MQW VISIBLE LASER DIODE  
 FOR DVD, DVD-ROM APPLICATIONS

**DESCRIPTION**

The NDL3321ST and NDL3321SU are AlGaInP 650 nm visible laser diodes and especially developed for DVD, DVD-ROM. The newly developed Multiple Quantum Well (MQW) LD chip, can achieve low operating current, wide temperature range.

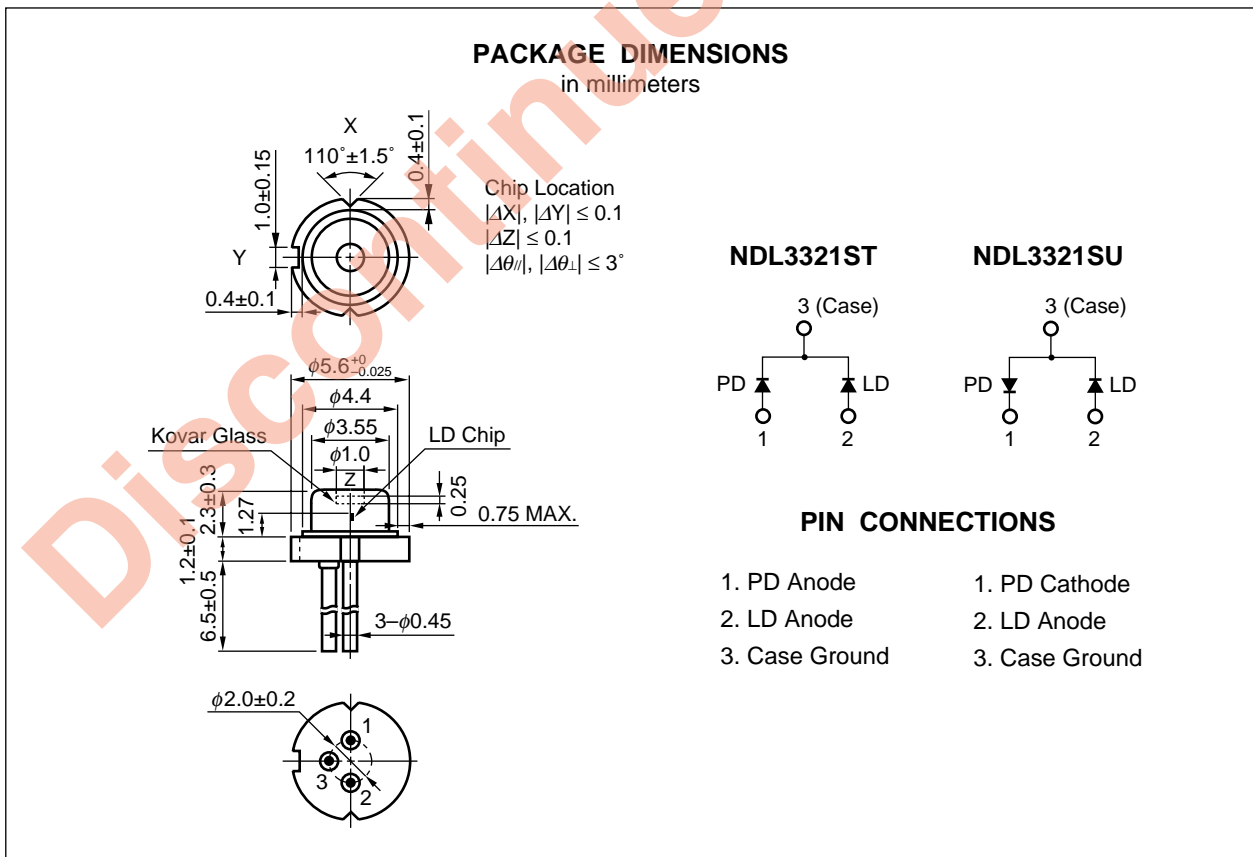
Use of a CD package allows easy replacement of conventional 780 nm LDs.

**FEATURES**

- |                         |                               |                                    |  |
|-------------------------|-------------------------------|------------------------------------|--|
| • Optical output power  | $P_o = 5.0 \text{ mW}$        | • Wide operating temperature range | $T_c = -10 \text{ to } +70 \text{ }^\circ\text{C}$ |
| • Low threshold current | $I_{th} = 45 \text{ mA TYP.}$ | • Peak emission wavelength         | $\lambda_p = 650 \text{ nm TYP.}$                  |
| • Low operating current | $I_{op} = 60 \text{ mA TYP.}$ | • Fundamental transverse mode      |  |
| • Low operating voltage | $V_{op} = 2.2 \text{ V TYP.}$ |                                    |  |

**APPLICATIONS**

- DVD, DVD-ROM
- Measurement Instrument



The information in this document is subject to change without notice.

**ABSOLUTE MAXIMUM RATINGS (T<sub>c</sub> = 25 °C, unless otherwise specified)**

Parameter	Symbol	Ratings	Unit
Optical Output Power	P <sub>o</sub>	6.0	mW
Reverse Voltage of LD	V <sub>R</sub>	2.0	V
Forward Current of PD	I <sub>F</sub>	20	mA
Reverse Voltage of PD	V <sub>R</sub>	30	V
Operating Case Temperature	T <sub>c</sub>	-10 to +70	°C
Storage Temperature	T <sub>stg</sub>	-40 to +85	°C

**RECOMMENDED OPERATING CONDITIONS (T<sub>c</sub> = 25 °C)**

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Optical Output Power	P <sub>o</sub>			5.0	mW

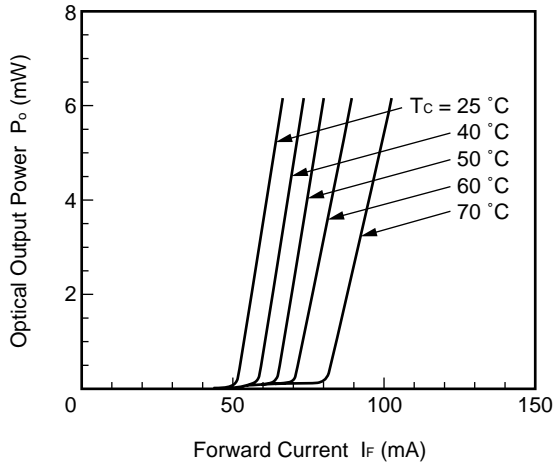
**ELECTRO-OPTICAL CHARACTERISTICS (T<sub>c</sub> = 25 °C)**

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Operating Voltage	V <sub>op</sub>	P <sub>o</sub> = 5.0 mW		2.2	2.7	V
Threshold Current	I <sub>th</sub>	CW		45	65	mA
Operating Current	I <sub>op</sub>	P <sub>o</sub> = 5.0 mW		60	80	mA
Monitor Current	I <sub>m</sub>	V <sub>R</sub> = 5 V, P <sub>o</sub> = 5.0 mW	0.1	0.3	0.5	mA
Peak Emission Wavelength	λ <sub>p</sub>	P <sub>o</sub> = 5.0 mW	645	650	657	nm
Vertical Beam Angle	θ <sub>L</sub>	P <sub>o</sub> = 5.0 mW, FAHM*1	25	30	35	deg.
Lateral Beam Angle	θ <sub>L</sub>	P <sub>o</sub> = 5.0 mW, FAHM*1	6	8	10	deg.

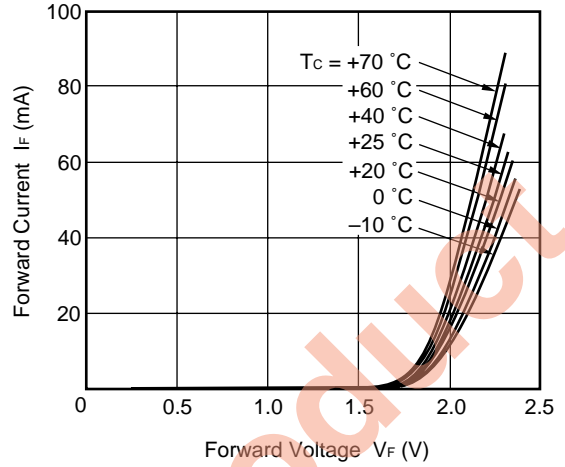
\*1 FAHM: Full Angle at Half Maximum

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

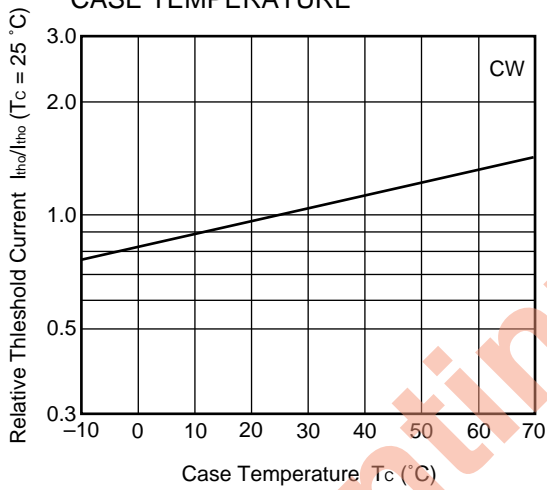
OPTICAL OUTPUT POWER vs. FORWARD CURRENT



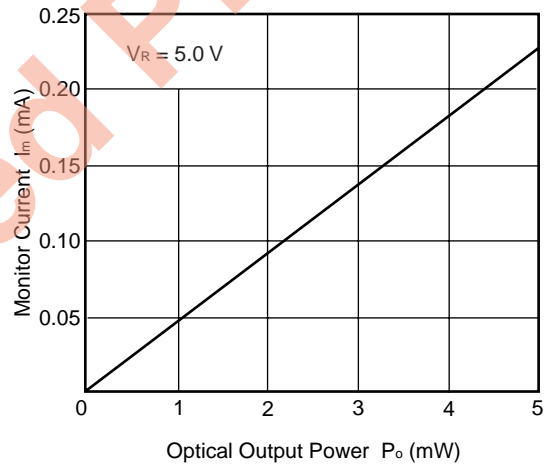
FORWARD CURRENT vs. FORWARD VOLTAGE



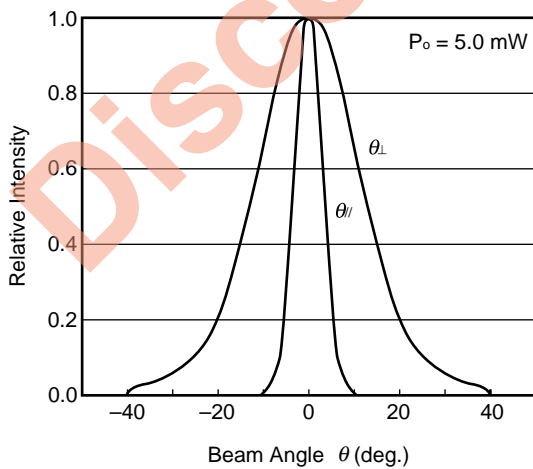
RELATIVE THRESHOLD CURRENT vs. CASE TEMPERATURE



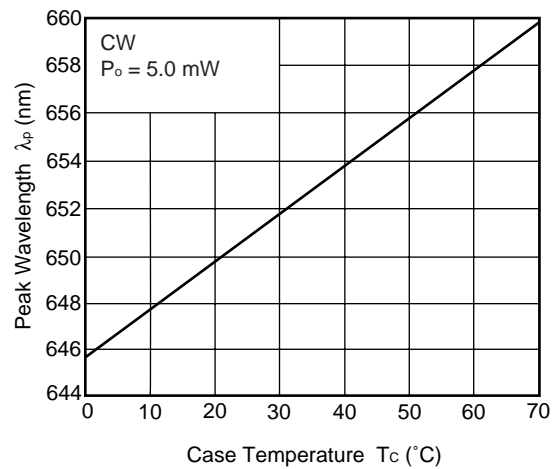
MONITOR CURRENT vs. OPTICAL OUTPUT POWER

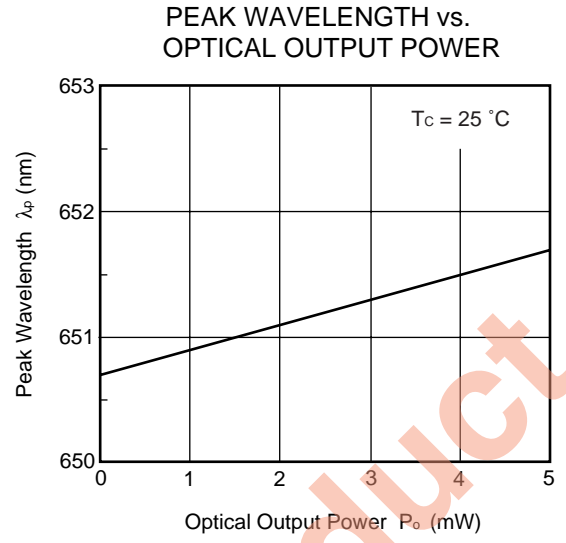
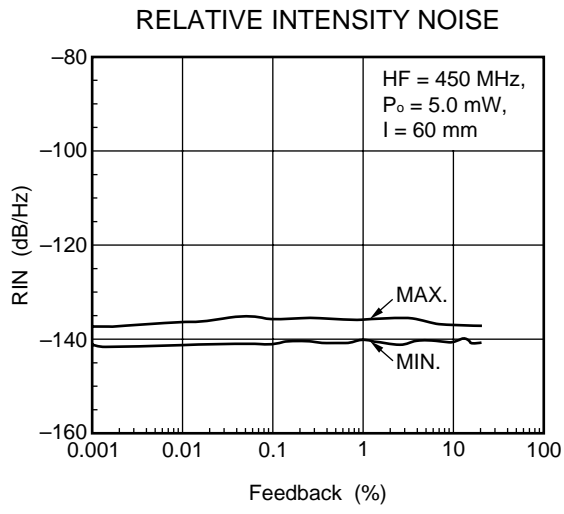


FAR FIELD PATTERN



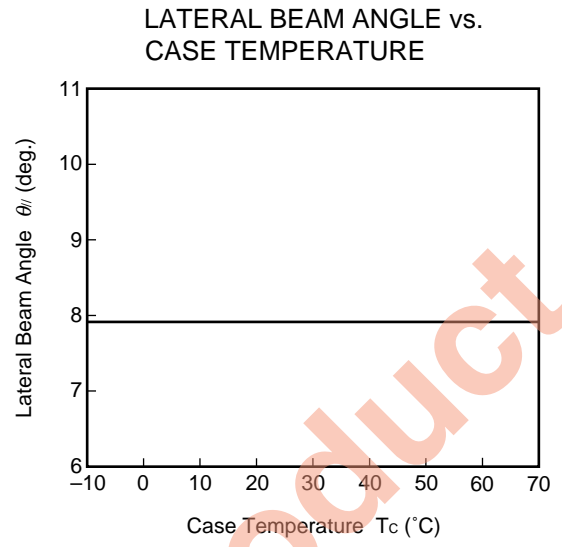
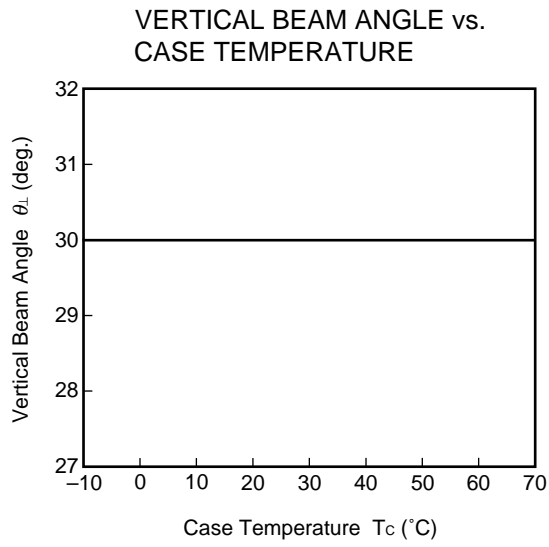
PEAK WAVELENGTH vs. CASE TEMPERATURE





Discontinued Product

★ TEMPERATURE DEPENDENCE OF OPTICAL CHARACTERISTICS



Discontinued Product

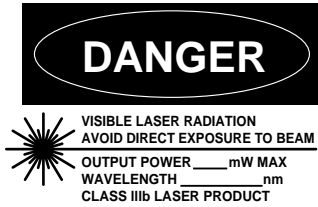
[MEMO]

**Discontinued Product**

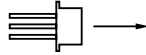


CAUTION

Within this device there exists GaAs (Gallium Arsenide) material which is a harmful substance if ingested. Please do not under any circumstances break the hermetic seal.



SEMICONDUCTOR LASER



AVOID EXPOSURE-Visible  
Laser Radiation is emitted from  
this aperture

NEC Corporation  
NEC Building, 7-1, Shiba 5-chome,  
Minato-ku, Tokyo 108-01, Japan

Type number: \_\_\_\_\_

Manufactured: \_\_\_\_\_

Serial Number: \_\_\_\_\_

This product conforms to FDA  
regulations as applicable  
to standards 21 CFR Chapter 1.  
Subchapter J.

Warning on Handling

To prevent health hazards, avoid looking directly or through lenses at beams from the operating laser diode.

Exceeding absolute maximum ratings' value may cause destruction or degradation of the device.

Discontinued Product

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Standard: Computers, office equipment, communications equipment, test and measurement equipment, audio and visual equipment, home electronic appliances, machine tools, personal electronic equipment and industrial robots

Special: Transportation equipment (automobiles, trains, ships, etc.), traffic control systems, anti-disaster systems, anti-crime systems, safety equipment and medical equipment (not specifically designed for life support)

Specific: Aircrafts, aerospace equipment, submersible repeaters, nuclear reactor control systems, life support systems or medical equipment for life support, etc.

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Anti-radioactive design is not implemented in this product.