NEC

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

NDL3321ST
NDL3321SU

FEATURES

- **OPTICAL OUTPUT POWER:**
  P_O = 5.0 mW
- **LOW THRESHOLD CURRENT:**
  I_{TH} = 45 mA TYP
- **LOW OPERATING CURRENT:**
  I_{OP} = 60 mA TYP
- **LOW OPERATING VOLTAGE:**
  V_{OP} = 2.2 V TYP
- **WIDE OPERATING TEMPERATURE RANGE:**
  T_C = -10 to +70 ˚C
- **PEAK EMISSION WAVELENGTH:**
  λ_p = 650 nm TYP
- **FUNDAMENTAL TRANSVERSE MODE**

APPLICATIONS

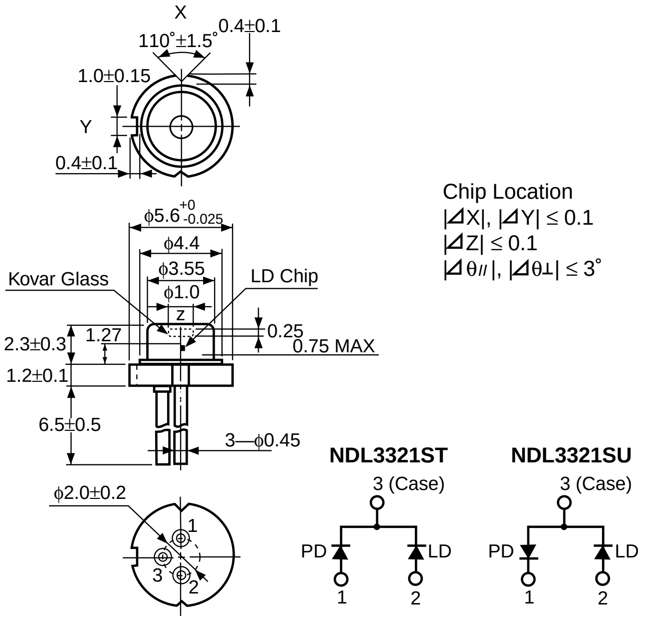
- **DVD, DVD-ROM**
- **MEASURMENT INSTRUMENTS**

DESCRIPTION

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

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

OUTLINE DIMENSIONS (Units in mm)



Chip Location
|⊿X|, |⊿Y| ≤ 0.1
|⊿Z| ≤ 0.1
|⊿θ//|, |⊿θ⊥| ≤ 3˚

Pin Connections

NDL3321ST	NDL3321SU
1. PD Anode	1. PD Cathode
2. LD Anode	2. LD Anode
3. Case Ground	3. Case Ground

ELECTRO-OPTICAL CHARACTERISTICS (T_C = 25˚C)

PART NUMBER			NDL3321ST, NDL3321SU		
SYMBOLS	**PARAMETERS AND CONDITIONS**	**UNITS**	**MIN**	**TYP**	**MAX**
V_{OP}	Operating Voltage, P_O = 5.0 mW	V		2.2	2.7
I_{TH}	Threshold Current, CW	mA		45	65
I_{OP}	Operating Current, P_O = 5.0 mW	mA		60	80
I_M	Monitor Current, V_R = 5 V, P_O = 5.0 mW	mA	0.1	0.3	0.5
λ_p	Peak Emission Wavelength, P_O = 5.0 mW	nm	645	650	657
$\theta_\perp$	Vertical Beam Angle, P_O = 5.0 mW, FAHM[1]	deg.	25	30	35
$\theta_{//}$	Lateral Beam Angle, P_O = 5.0 mW, FAHM[1]	deg.	6	8	10

Note:

1. FAHM: Full Angle at Half Maximum.

ABSOLUTE MAXIMUM RATINGS[1]

(TC = 25˚C, unless otherwise specified)

SYMBOLS	PARAMETERS	UNITS	RATINGS
P_O	Optical Output Power	mW	6.0
V_R	Reverse Voltage of LD	V	2.0
I_F	Forward Current of PD	mA	20
V_R	Reverse Voltage of PD	V	30
T_C	Operating Case Temperature	˚C	-10 to +70
T_{STG}	Storage Temperature	˚C	-40 to +85

Note:

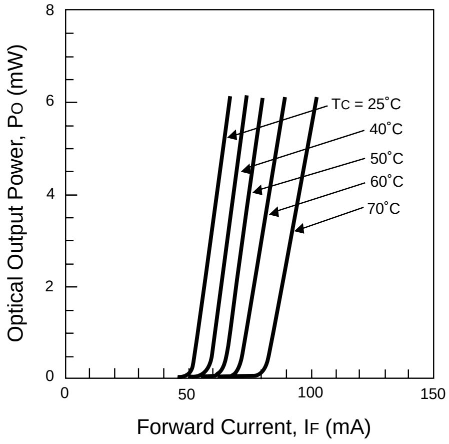
1. Operation in excess of any one of these parameters may result in permanent damage.

RECOMMENDED OPERATING CONDITIONS (TC = 25˚C)

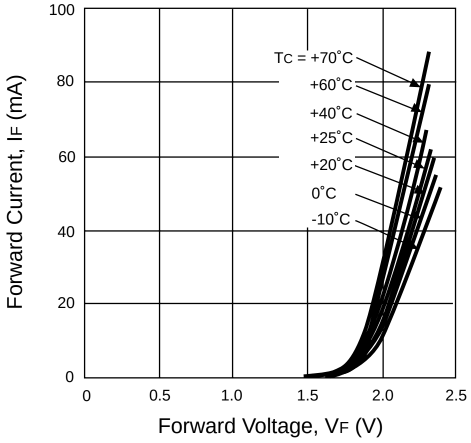
SYMBOL	PARAMETER	UNIT	MIN	TYP	MAX
P_O	Optical Output Power	mW			5.0

TYPICAL PERFORMANCE CURVES (TC = 25˚C unless otherwise specified)

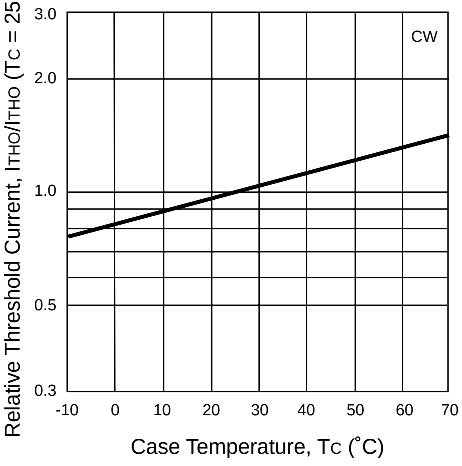
OPTICAL OUTPUT POWER vs. FORWARD CURRENT



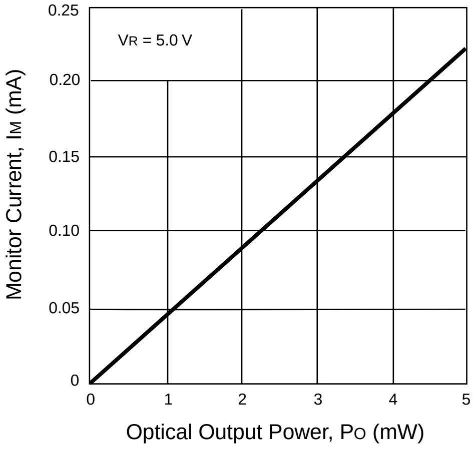
FORWARD CURRENT vs. FORWARD VOLTAGE



RELATIVE THRESHOLD CURRENT vs. CASE TEMPERATURE

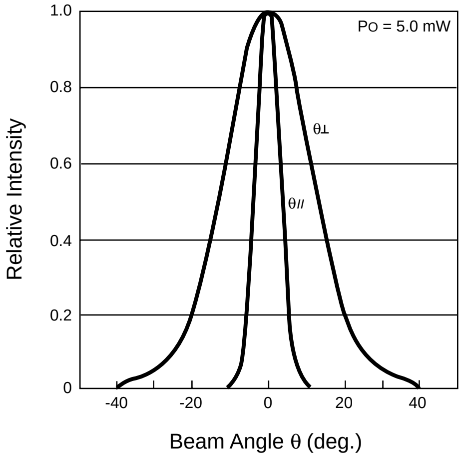


MONITOR CURRENT vs. OPTICAL OUTPUT POWER

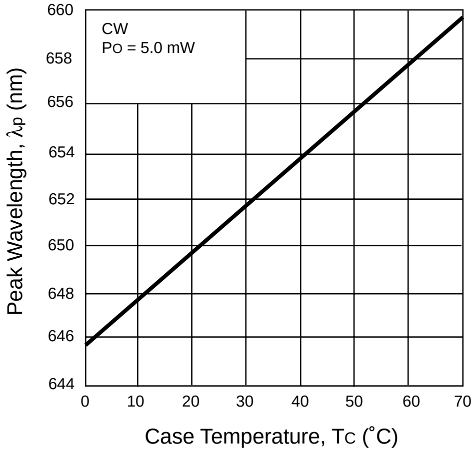


TYPICAL PERFORMANCE CURVES (TC = 25˚C unless otherwise specified)

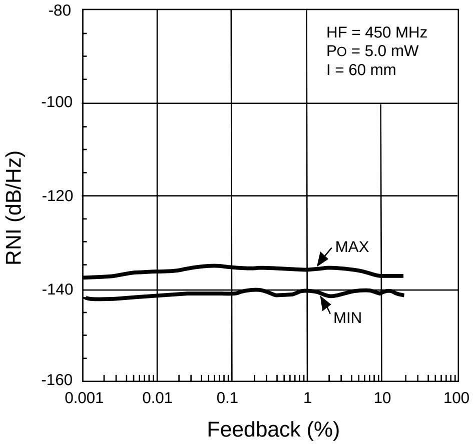
FAR FIELD PATTERN



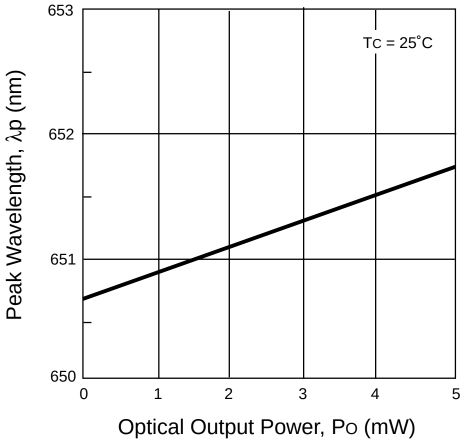
PEAK WAVELENGTH vs. CASE TEMPERATURE



RELATIVE NOISE INTENSITY

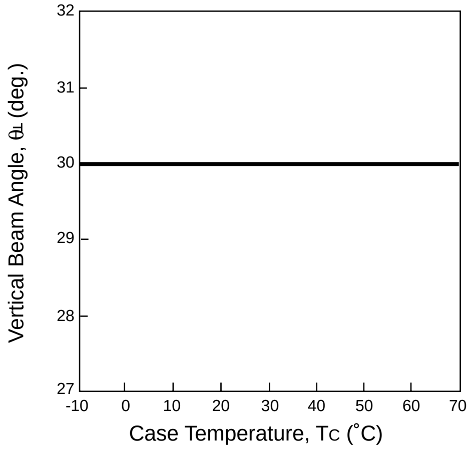


PEAK WAVELENGTH vs. OPTICAL OUTPUT POWER

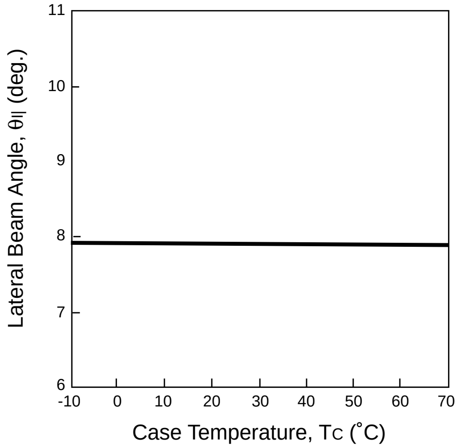


TEMPERATURE DEPENDENCE OF OPTICAL CHARACTERISTICS

VERTICAL BEAM ANGLE vs. CASE TEMPERATURE

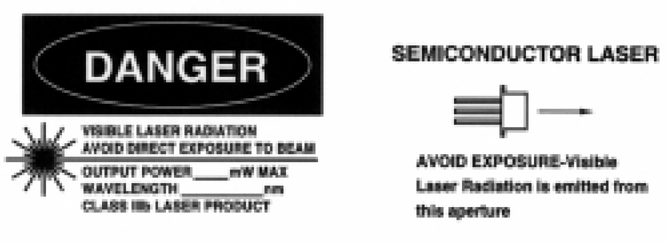


LATERAL BEAM ANGLE vs. CASE TEMPERATURE



CAUTION

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



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.