# NDL5003

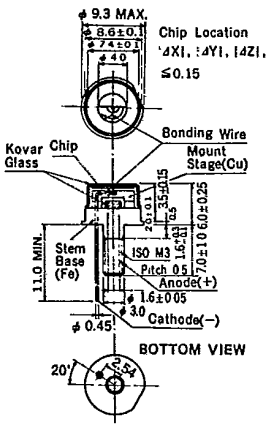
## 1 300 nm OPTICAL FIBER COMMUNICATIONS InGaAsP DOUBLE HETEROSTRUCTURE LASER DIODE

### DESCRIPTION

NDL5003 is a long wavelength laser diode especially designed for long distance high capacity transmission systems. The DC-PBH (Double Channel Planar Buried Heterostructure) can achieve stable fundamental oscillation in wide temperature range.

### PACKAGE DIMENSIONS

in millimeters




### FEATURES

- High output power. $P_O$ = 8 mW
- Long wavelength. $\lambda_P$ = 1 300 nm
- Low threshold current. $I_{th}$ = 20 mA
- Narrow vertical angle and wide lateral beam angle.
  $\theta_\perp \times \theta_{/\!/} = 35° \times 28°$
- Fundamental transverse mode.
- Wide operating temperature range.

### ABSOLUTE MAXIMUM RATINGS ($T_a$ = 25 °C)

| | | | |
|---|---|---|---|
| Reverse Voltage | $V_R$ | 2.0 | V |
| Optical Output Power | $P_O$ | 15 | mW |
| Operating Case Temperature | $T_C$ | −40 to +70 | °C |
| Storage Temperature | $T_{stg}$ | −55 to +125 | °C |

### ELECTRO-OPTICAL CHARACTERISTICS ($T_a$ = 25 °C)

| CHARACTERISTIC | SYMBOL | MIN. | TYP. | MAX. | UNIT | TEST CONDITIONS |
|---|---|---|---|---|---|---|
| Forward Voltage | $V_F$ | | | 1.3 | V | $I_F$ = 30 mA |
| Threshold Current | $I_{th}$ | | 20 | 35 | mA | |
| Optical Output Power | $P_O$ | 6.0 | 8.0 | | mW | $I_F = I_{th}$ +30 mA |
| Monitor Output Power | $P_m$ | 0.5 | 1.0 | | mW | $P_O$ = 6.0 mW |
| Peak Emission Wavelength | $\lambda_P$ | 1270 | 1300 | 1330 | nm | $P_O$ = 6.0 mW |
| Half Power Spectral Width | $\Delta\lambda$ | | | 4.0 | nm | $P_O$ = 6.0 mW |
| Vertical Beam Angle | $\theta_\perp$ | | 35 | | deg. | $P_O$ = 6.0 mW, FAHM * |
| Lateral Beam Angle | $\theta_{/\!/}$ | | 28 | | deg. | $P_O$ = 6.0 mW, FAHM * |
| Rise Time | $t_r$ | | 0.5 | 1.0 | ns | 10–90 % |
| Fall Time | $t_f$ | | 0.7 | 1.0 | ns | 90–10 % |

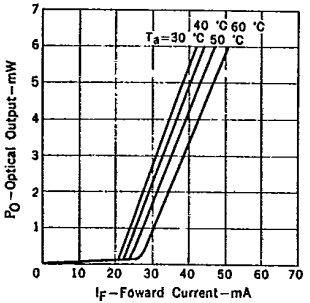
* FAHM: Full Angle at Half Maximum

## ELECTRO-OPTICAL CHARACTERISTICS ($T_a$ = 60 °C)

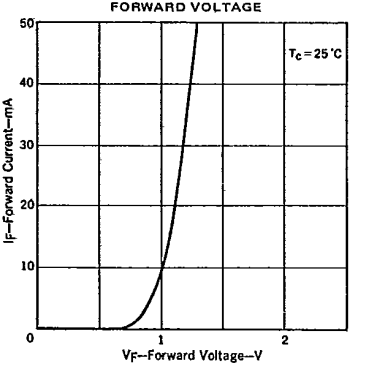
| CHARACTERISTIC | SYMBOL | MIN. | TYP. | MAX. | UNIT | TEST CONDITION |
|---|---|---|---|---|---|---|
| Forward Voltage | $V_F$ | | | 1.3 | V | $I_F$ = 30 mA |
| Threshold Current | $I_{th}$ | | 40 | 60 | mA | |
| Optical Output Power | $P_O$ | 5.0 | | | mW | $I_F = I_{th}$ +30 mA |
| Peak Emission Wavelength | $\lambda_P$ | 1275 | 1315 | 1350 | nm | $P_O$ = 5.0 mW |
| Monitor Output Power | $P_m$ | 300 | | | μW | $P_O$ = 5.0 mW |
| Half Power Spectral Width | $\Delta\lambda$ | | | 4.0 | nm | $P_O$ = 5.0 mW |
| Rise Time | $t_r$ | | 0.5 | 1.0 | ns | 10–90 % |
| Fall Time | | | 0.7 | 1.0 | ns | 90–10 % |

## TYPICAL CHARACTERISTICS ($T_a$ = 25 °C)

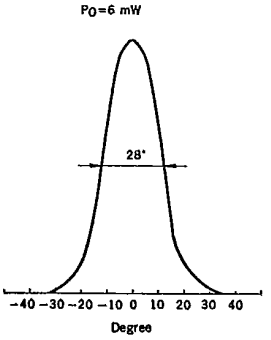
FORWARD CURRENT vs. OPTICAL OUTPUT



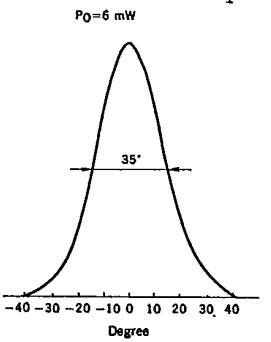

FORWARD CURRENT vs. FORWARD VOLTAGE



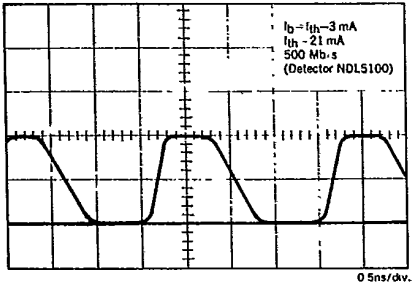

FAR FIELD PATTERN ($\theta_{//}$)




FAR FIELD PATTERN ($\theta_{\perp}$)



PULSE RESPONSE




LONGITUDINAL MODE EMISSION SPECTRUM