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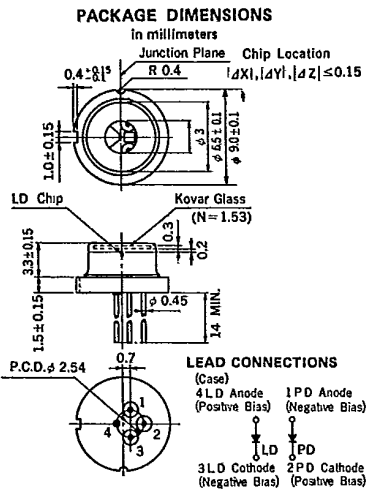
N E C ELECTRONICS INC

LASER DIODE NDL5004

1 300 nm OPTICAL FIBER COMMUNICATIONS InGaAsP DOUBLE HETEROSTRUCTURE LASER DIODE

DESCRIPTION

NDL5004 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.



FEATURES

- High output power. $P_O = 8 \text{ mW}$
- Long wavelength. $\lambda_p = 1300 \text{ nm}$
- Low threshold current. $I_{th} = 20 \text{ mA}$
- Narrow vertical angle and wide lateral beam angle
 $\theta_l \times \theta_f = 35^\circ \times 28^\circ$
- Fundamental transverse mode.
- Wide operating temperature range.

ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ \text{C}$)

Reverse Voltage of LD	V_R	2.0	V
Optical Output Power of LD	P_O	15	mW
Operating Case Temperature	T_C	-40 to +70	$^\circ \text{C}$
Storage Temperature	T_{stg}	-55 to +125	$^\circ \text{C}$
Forward Current of PD	I_F	25	mA
Reverse Voltage of PD	V_R	20	V

ELECTRO-OPTICAL CHARACTERISTICS ($T_a = 25^\circ \text{C}$)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Forward Voltage	V_F			1.3	V	$I_F = 30 \text{ mA}$
Threshold Current	I_{th}		20	35	mA	
Optical Output Power	P_O	6.0	8.0		mW	$I_F = I_{th} + 30 \text{ mA}$
Peak Emission Wavelength	λ_p	1270	1300	1330	nm	$P_O = 6.0 \text{ mW}$
Half Power Spectral Width	$\Delta\lambda$			4.0	nm	$P_O = 6.0 \text{ mW}$
Vertical Beam Angle	θ_l		35		deg.	$P_O = 6.0 \text{ mW}$, FAHM*
Lateral Beam Angle	θ_f		28		deg.	$P_O = 6.0 \text{ mW}$, FAHM*
Rise Time	t_r		0.5	1.0	ns	10-90 %
Fall Time	t_f		0.7	1.0	ns	90-10 %
Monitor Current of PD	I_m	300	500	1500	μA	$V_R = 5 \text{ V}$, $P_O = 6.0 \text{ mW}$
Dark Current of PD	I_D			3	μA	$V_R = 5 \text{ V}$

* FAHM : Full Angle at Half Maximum

NDL5004

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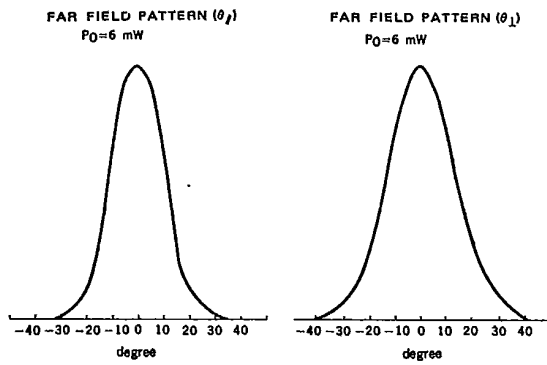
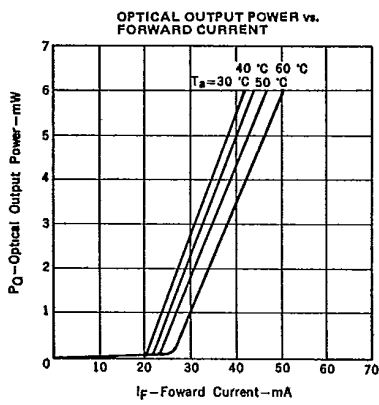
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ELECTRO-OPTICAL CHARACTERISTICS ($T_a = 60^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Forward Voltage	V_F			1.3	V	$I_F = 30\text{ mA}$
Threshold Current	I_{th}		40	60	mA	
Optical Output Power	P_O	5.0			mW	$I_F = I_{th} + 30\text{ mA}$
Peak Emission Wavelength	λ_p	1275	1315	1350	nm	$P_O = 5.0\text{ mW}$
Half Power Spectral Width	$\Delta\lambda$			4.0	nm	$P_O = 5.0\text{ mW}$
Rise Time	t_r		0.5	1.0	ns	10-90%
Fall Time	t_f		0.7	1.0	ns	90-10%
Monitor Current of PD	I_m	200			μA	$V_R = 5\text{ V}, P_O = 5.0\text{ mW}$
Dark Current of PD	I_D		12	26	μA	$V_R = 5\text{ V}$

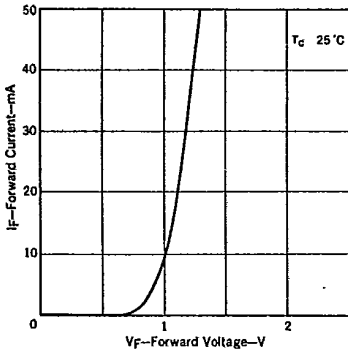
TYPICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)



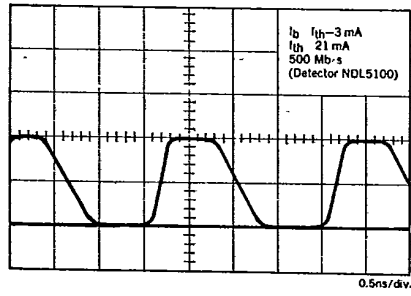
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FORWARD CURRENT vs. FORWARD VOLTAGE



PULSE RESPONSE



LONGITUDINAL MODE EMISSION SPECTRUM

