NEC
ELECTRON DEVICE

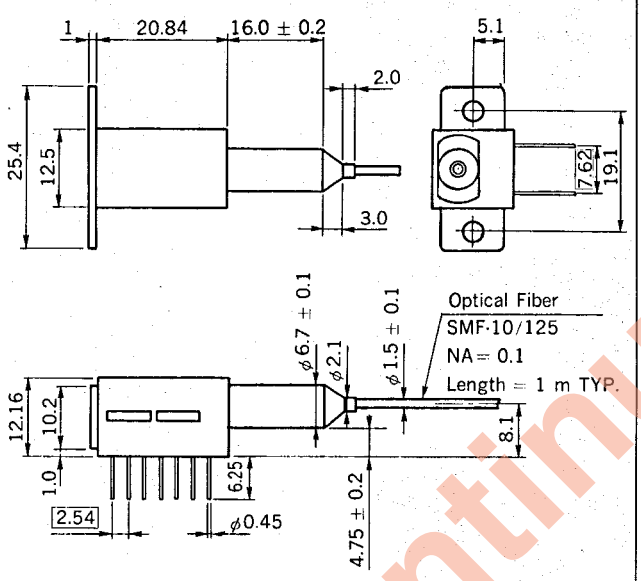
LASER DIODE MODULE
NDL5034P

1 310 nm OPTICAL FIBER COMMUNICATION
InGaAsP DC-PBH LASER DIODE MODULE

DESCRIPTION

NDL5034P is a 1 310 nm laser diode DIP module with internal thermo-electric cooler.
It incorporates lenses for optical coupling between laser chip and fiber. This special lens coupling system can achieve not only better optical coupling efficiency but also stable optical output power from fiber.

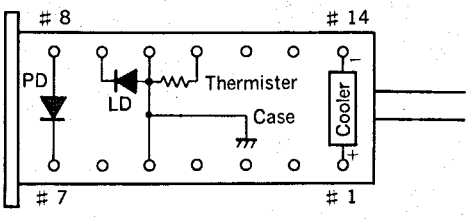
PACKAGE DIMENSIONS
in millimeters



PIN CONNECTIONS

PIN No.	FUNCTION	PIN No.	FUNCTION
1	COOLER ANODE	8	PD ANODE
2	NC	9	LASER CATHODE
3	NC	10	LASER ANODE, CASE GROUND and THERMISTER
4	NC	11	THERMISTER
5	LASER ANODE, CASE GROUND and THERMISTER	12	NC
6	NC	13	NC
7	PD CATHODE	14	COOLER CATHODE

BOTTOM VIEW



FEATURES

- High output power. P_f = 2.0 mW TYP.
- High speed. t_r = 0.5 ns TYP., t_f = 0.7 ns TYP.
- Low threshold current. I_{th} = 20 mA TYP.
- Long wavelength λ_P = 1310 nm
- Internal thermo-electric cooler.
- Hermetically sealed 14 pin Dual-In-Line Package.
- Single mode fiber.
- Wide operating temperature range.
- High reliability.

ABSOLUTE MAXIMUM RATINGS (T_a = 25 °C)

Operating Case Temperature	T_C	−20 to +70	°C
Storage Temperature	T_{stg}	−40 to +70	°C
Lead Soldering Temperature (10 s)	T_S	260	°C
Forward Current of LD	I_F	I_{th}+50	mA
Reverse Voltage of LD	V_R	2.0	V
Forward Current of PD	I_F	25	mA
Reverse Voltage of PD	V_R	20	V

The following characteristics are guaranteed in the condition of T_L = 25±15 °C.

- Kink Free up to P_f = 1.5 mW
- Mode Sprit Free up to P_f = 1.5 mW

ELECTRO-OPTICAL CHARACTERISTICS (T_L = 25 °C, T_c = –20 °C to +70 °C)

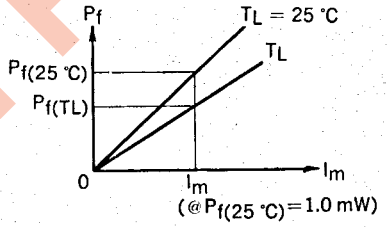
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
DC Threshold Current	I_{th}(dc)		20	35	mA	
DC Forward Voltage	V_F(dc)			1.3	V	I_F = 30 mA
Optical Output Power from Fiber	P_f	1.0	2.0		mW	$I_F = I_{th}$+30 mA
Spontaneous Emission Power from Fiber	P_s			40	μW	$I_F = I_{th}$
Peak Emission Wavelength	λ_P	1290	1310	1330	nm	P_f = 1.0 mW
Spectral Width	$\Delta\lambda$		2.0		nm	P_f = 1.0 mW
Differential Quantum Efficiency from Fiber	η_f	0.033	0.1		mW/mA	$I_{th} \leqq I_F \leqq I_{th}$+30 mA
P_f Rise Time	t_r		0.5	1.0	ns	10 – 90 %
P_f Fall Time	t_f		0.7	1.0	ns	90 – 10 %

ELECTRO-OPTICAL CHARACTERISTICS (Applicable to Monitor PD T_L = 25 °C, T_c = –20 °C to +70 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Monitor Current	I_m	100	200	500	μA	V_R = 5 V, P_f = 1.0 mW
Rise Time	t_r		3	5	ns	V_R = 5 V, R_L = 100 Ω
Fall Time	t_f		5	8	ns	V_R = 5 V, R_L = 100 Ω
Dark Current	I_D			1.0	μA	V_R = 5 V
Tracking Error	γ *1			0.5	dB	I_m = const., T_L = 0 °C, 40 °C

*1 Tracking Error : γ

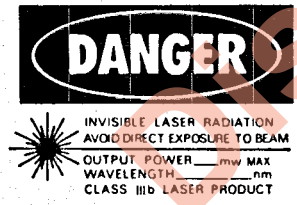
$$\gamma = 10 \log \frac{P_{f(TL)}}{P_{f(25\,^\circ C)}} \quad (T_L = 10\,^\circ C,\ 40\,^\circ C)$$



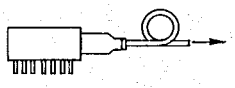
ELECTRO-OPTICAL CHARACTERISTICS (Applicable to Thermistor and TE Cooler T_L = 25 °C, T_c = –20 °C to +70 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Thermistor Resistance	R *2	9.5	10	10.5	kΩ	T_L = 25 °C
Cooler Current	I_c			1.0	A	
Supply Voltage	V_c			1.0	V	
Cooling Capacity	ΔT *3	45			°C	$I_C \leqq$ 1.0 A, P_f = 1.0 mW

*2 B Constant (= 3400±100 K)
*3 $\Delta T = |T_c - T_L|$



SEMICONDUCTOR LASER



AVOID EXPOSURE-Invisible Laser Radiation is emitted from this aperture

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Type number: _____
Manufactured: _____
Serial number: _____
This product conforms to DHHS regulations as applicable to standards 21 CFR Chapter I, Subchapter J.

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