NEC

LASER DIODE
NDL7672P

1310 nm OPTICAL CATV/ANALOG APPLICATIONS
InGaAsP STRAINED MQW-DFB LASER DIODE MODULE

DESCRIPTION

NDL7672P is a 1310 nm DFB (Distributed Feed-Back) laser diode, that has a newly developed Strained Multiple Quantum Well (MQW) structure, butterfly package module with optical isolator. It is especially designed for a 12 mW light source of CATV analog applications.

FEATURES

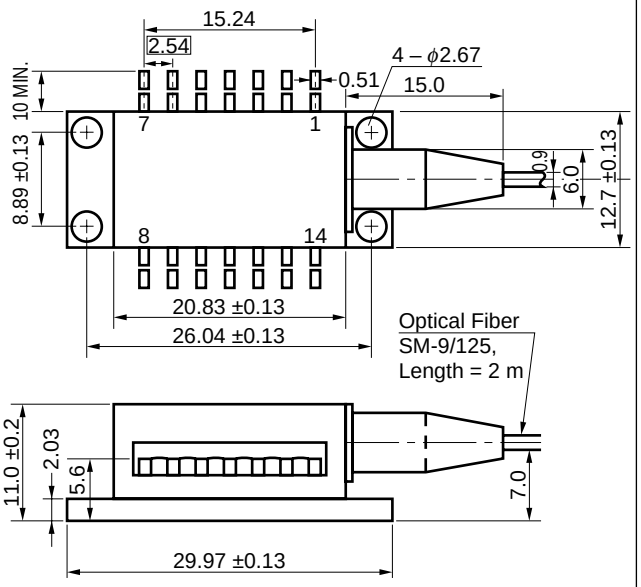
- Low noise — RIN = 158 dB/Hz
- Low distortion — CSO = –60 dBc
  CTB = –65 dBc
- High output power — P_f = 12.0 mW
- Long wavelength — λ_P = 1310 nm
- High isolation — 40 dB
- Internal InGaAs monitor PD
- Internal thermoelectric cooler
- Hermetically sealed 14 pin butterfly Package
- Singlemode fiber pigtail
- Wide operating temperature range
- High reliability

ORDERING INFORMATION

Part Number	Available Connector
NDL7672P	Without Connector
NDL7672PC	With FC-UPC Connector
NDL7672PD	With SC-UPC Connector

PACKAGE DIMENSIONS

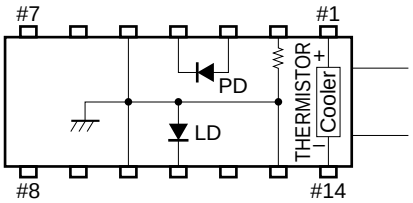
in millimeters



PIN CONNECTIONS

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

TOP VIEW



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

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ABSOLUTE MAXIMUM RATINGS (T_C = 25 °C)

Parameter	Symbol	Ratings	Unit
Operating Case Temperature	T_C	–20 to +65	°C
Storage Temperature	T_{stg}	–40 to +70	°C
Lead Soldering Temperature (10 s)	T_{sld}	260	°C
Optical Output Power	P_f	25	mW
Forward Current of LD	I_F	150	mA
Reverse Voltage of LD	V_R	2.0	V
Forward Current of PD	I_F	10	mA
Reverse Voltage of PD	V_R	20	V
Cooler Current	I_C	1.0	A
Cooler Voltage	V_C	2.0	V

ELECTRO-OPTICAL CHARACTERISTICS (T_{LD} = 25 °C, T_C = –20 °C to +65 °C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Threshold Current	I_{th}			20	35	mA
Forward Voltage	V_F	I_F = 30 mA	0.9	1.2	1.4	V
Optical Output Power from Fiber (Recommended Operating Point)	P_{OP} *1		12.0			mW
Spontaneous Emission Power from Fiber	P_s	$I_b = I_{th}$			50	μW
Differential Efficiency from Fiber	η_d	$P_f \leq P_{op}$	0.25			mW/mA
Peak Emission Wavelength	λ_P	$P_f = P_{op}$	1290	1310	1330	nm
Sub-mode Suppression Ratio	SMSR	$P_f = P_{op}$	30	35		dB
1 dB Bandwidth	f	$P_f = P_{op}$	900			MHz
Relative Intensity Noise	RIN*2	$P_f = P_{op}$		–158	–155	dB/Hz
Composite Second Order Distortion	CSO*3	$P_f = P_{op}$		–60	–55	dBc
Composite Triple Beat Distortion	CTB*3	$P_f = P_{op}$		–65	–60	dBc
Carrier to Noise Ratio	CNR*3	$P_f = P_{op}$	49	51		dBc
Isolation	I_S		35	40		dB

***1** Recommended Pop value is supplied with each device.

***2** Conditions : $P_f = P_{op}$, CW
Measuring Bandwidth: 50 MHz to 600 MHz
Optical Reflection –40 dB

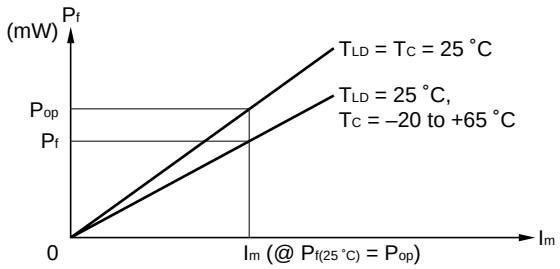
***3** Conditions : $P_f = P_{op}$, Optical Modulation Index = 3.5 %/channel
79 channel unmodulated carriers (55.25 MHz to 547.25 MHz)
Optical Reflection –40 dB, Optical Loss = 10.6 dB

ELECTRO-OPTICAL CHARACTERISTICS
(Applicable to Monitor PD: T_{LD} = 25 °C, T_C = –20 °C to +65 °C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Monitor Current	I_m	V_R = 5 V, $P_f = P_{op}$	50			μA
Dark Current	I_D	V_R = 5 V		2	10	nA
Tracking Error	γ *4	I_m = const.			0.5	dB

***4** Tracking Error : γ

$$\gamma = \left| 10 \log \frac{P_f}{P_{op}} \right|$$



ELECTRO-OPTICAL CHARACTERISTICS
(Applicable to Thermistor and TE Cooler: T_{LD} = 25 °C, T_C = –20 °C to +65 °C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Thermistor Resistance	R*5	T_{LD} = 25 °C	9.5	10	10.5	kΩ
Cooler Current	I_C	ΔT = 40 K		0.6	0.8	A
Cooler Voltage	V_C	ΔT = 40 K		1.1	1.5	V
Cooling Capacity	ΔT*6	I_C = 0.8 A, $P_f = P_{op}$	40			K

***5** B Constant = 3400 ±100 K

***6** $\Delta T = |T_C - T_{LD}|$

DFB LASER FAMILY FOR CATV/ANALOG APPLICATIONS

FEATURES	P_{op}: Operating point power (min. value)					
	3 mW min.	4 mW min.	6 mW min.	8 mW min.	12 mW min.	15 mW min.
14 PIN BFY MODULE WITH SMF	NDL7680P	NDL7650P	NDL7660P	NDL7670P	NDL7672P	NDL7673P

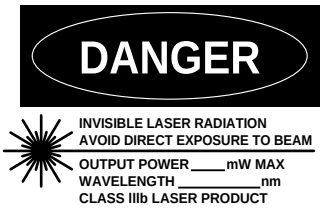
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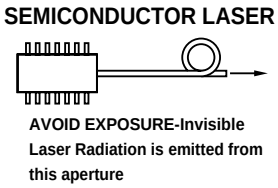
Document Name	Document No.
NEC semiconductor device reliability/quality control system	LEI-1201
Quality grades on NEC semiconductor devices	IEI-1209
Semiconductor device mounting technology manual	C10535E
Guide to quality assurance for semiconductor devices	MEI-1202
Semiconductor selection guide	X10679E

[MEMO]

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.





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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.

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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)

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The quality grade of NEC devices in "Standard" unless otherwise specified in NEC's Data Sheets or Data Books. If customers intend to use NEC devices for applications other than those specified for Standard quality grade, they should contact NEC Sales Representative in advance.

Anti-radioactive design is not implemented in this product.

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