NEC

LASER DIODE
NX8562LB

1 550 nm InGaAsP MQW-DFB LASER DIODE MODULE
CW LIGHT SOURCE FOR DWDM APPLICATIONS

DESCRIPTION

The NX8562LB is a 1 550 nm Multiple Quantum Well (MQW) structured Distributed Feed-Back (DFB) laser diode module with Polarization Maintain Fiber (PMF).

It is designed as Continuous Wave (CW) light source and ideal for optical transmission systems with external modulators.

The device is available for Dense Wavelength Division Multiplexing (DWDM) wavelengths based on ITU-T recommendations, enabling a wide range of applications.

FEATURES

- Output power P_f = 20 mW MIN.
- ★ Available for DWDM wavelengths based on ITU-T recommendations (100 GHz grid)
  Refer to the ORDERING INFORMATIONS
- Internal thermo-electric cooler and isolator
- Hermetically sealed 14-pin butterfly package
- Polarization maintain fiber pigtail

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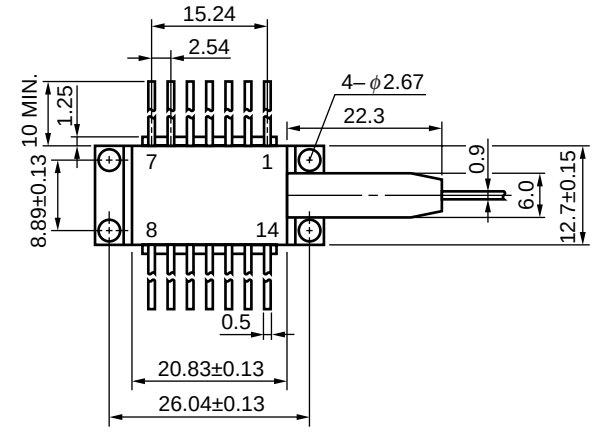
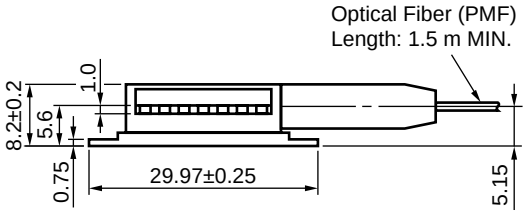
Printed in Japan

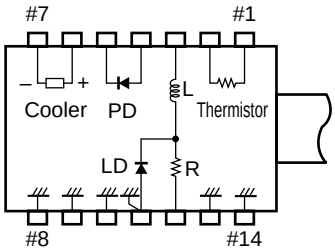
The mark ★ shows major revised points.

★ **PACKAGE DIMENSIONS (UNIT : mm)**





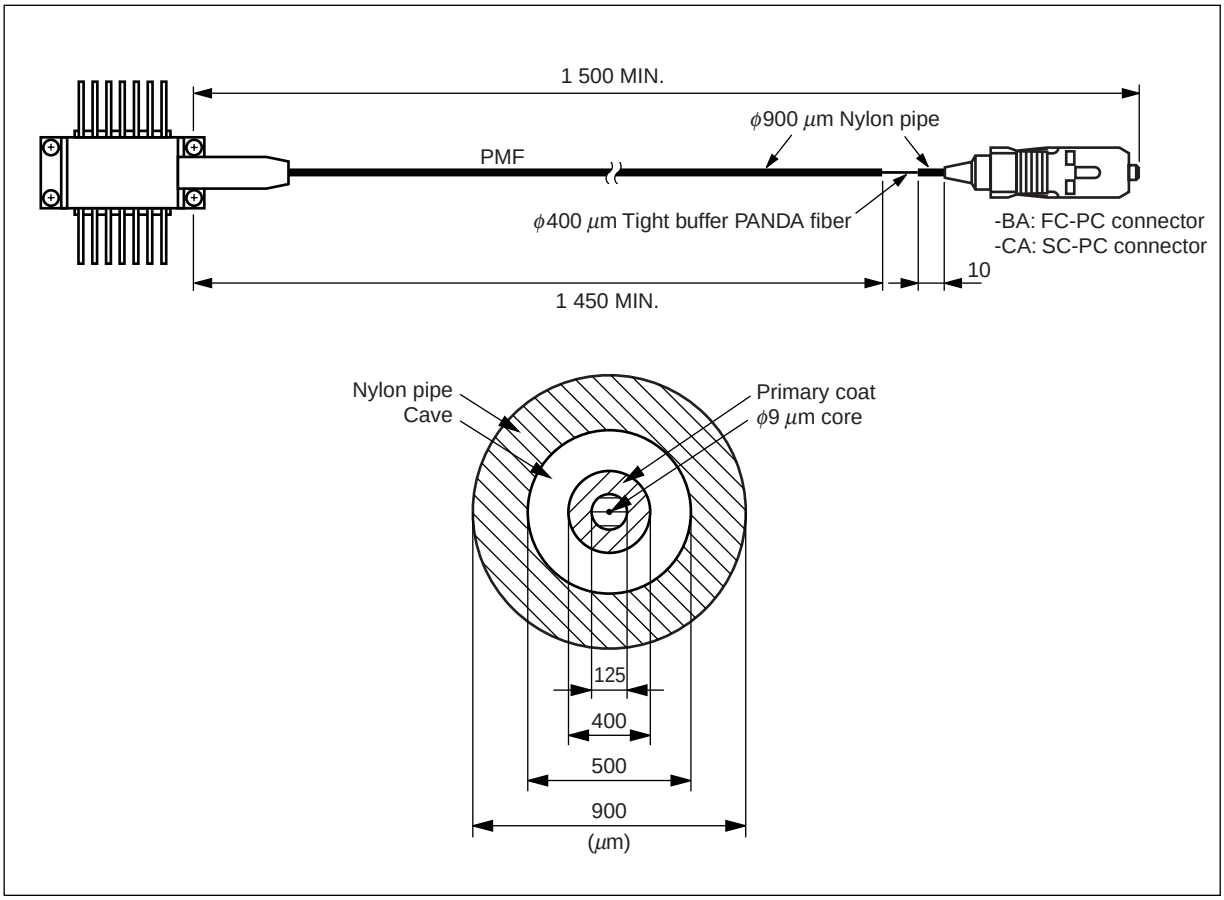
TOP VIEW



PIN CONNECTIONS

Pin No.	Function	Pin No.	Function
1	Thermistor	8	GND
2	Thermistor	9	GND
3	Bias	10	GND
4	PD Anode	11	GND, LD Anode
5	PD Cathode	12	Signal Input
6	Cooler Anode	13	GND
7	Cooler Cathode	14	GND

★ **OPTICAL FIBER DIMENSIONS (UNIT : mm)**



★ ORDERING INFORMATION

Part Number			ITU-T Wavelength*1	Frequency
Without Connector	With FC-PC Connector	With SC-PC Connector	(nm)	(THz)
NX8562LB279	NX8562LB279-BA	NX8562LB279-CA	1527.99	196.20
NX8562LB287	NX8562LB287-BA	NX8562LB287-CA	1528.77	196.10
NX8562LB295	NX8562LB295-BA	NX8562LB295-CA	1529.55	196.00
NX8562LB303	NX8562LB303-BA	NX8562LB303-CA	1530.33	195.90
NX8562LB311	NX8562LB311-BA	NX8562LB311-CA	1531.11	195.80
NX8562LB318	NX8562LB318-BA	NX8562LB318-CA	1531.89	195.70
NX8562LB326	NX8562LB326-BA	NX8562LB326-CA	1532.68	195.60
NX8562LB334	NX8562LB334-BA	NX8562LB334-CA	1533.46	195.50
NX8562LB342	NX8562LB342-BA	NX8562LB342-CA	1534.25	195.40
NX8562LB350	NX8562LB350-BA	NX8562LB350-CA	1535.03	195.30
NX8562LB358	NX8562LB358-BA	NX8562LB358-CA	1535.82	195.20
NX8562LB366	NX8562LB366-BA	NX8562LB366-CA	1536.60	195.10
NX8562LB373	NX8562LB373-BA	NX8562LB373-CA	1537.39	195.00
NX8562LB381	NX8562LB381-BA	NX8562LB381-CA	1538.18	194.90
NX8562LB389	NX8562LB389-BA	NX8562LB389-CA	1538.97	194.80
NX8562LB397	NX8562LB397-BA	NX8562LB397-CA	1539.76	194.70
NX8562LB405	NX8562LB405-BA	NX8562LB405-CA	1540.55	194.60
NX8562LB413	NX8562LB413-BA	NX8562LB413-CA	1541.34	194.50
NX8562LB421	NX8562LB421-BA	NX8562LB421-CA	1542.14	194.40
NX8562LB429	NX8562LB429-BA	NX8562LB429-CA	1542.93	194.30
NX8562LB437	NX8562LB437-BA	NX8562LB437-CA	1543.73	194.20
NX8562LB445	NX8562LB445-BA	NX8562LB445-CA	1544.52	194.10
NX8562LB453	NX8562LB453-BA	NX8562LB453-CA	1545.32	194.00
NX8562LB461	NX8562LB461-BA	NX8562LB461-CA	1546.11	193.90
NX8562LB469	NX8562LB469-BA	NX8562LB469-CA	1546.91	193.80
NX8562LB477	NX8562LB477-BA	NX8562LB477-CA	1547.71	193.70
NX8562LB485	NX8562LB485-BA	NX8562LB485-CA	1548.51	193.60
NX8562LB493	NX8562LB493-BA	NX8562LB493-CA	1549.31	193.50
NX8562LB501	NX8562LB501-BA	NX8562LB501-CA	1550.11	193.40
NX8562LB509	NX8562LB509-BA	NX8562LB509-CA	1550.91	193.30
NX8562LB517	NX8562LB517-BA	NX8562LB517-CA	1551.72	193.20
NX8562LB525	NX8562LB525-BA	NX8562LB525-CA	1552.52	193.10
NX8562LB533	NX8562LB533-BA	NX8562LB533-CA	1553.32	193.00
NX8562LB541	NX8562LB541-BA	NX8562LB541-CA	1554.13	192.90

***1** The value which omitted and computed the 3rd place below the decimal point

Part Number			ITU-T Wavelength*1	Frequency
Without Connector	With FC-PC Connector	With SC-PC Connector	(nm)	(THz)
NX8562LB549	NX8562LB549-BA	NX8562LB549-CA	1554.94	192.80
NX8562LB557	NX8562LB557-BA	NX8562LB557-CA	1555.74	192.70
NX8562LB565	NX8562LB565-BA	NX8562LB565-CA	1556.55	192.60
NX8562LB573	NX8562LB573-BA	NX8562LB573-CA	1557.36	192.50
NX8562LB581	NX8562LB581-BA	NX8562LB581-CA	1558.17	192.40
NX8562LB589	NX8562LB589-BA	NX8562LB589-CA	1558.98	192.30
NX8562LB597	NX8562LB597-BA	NX8562LB597-CA	1559.79	192.20
NX8562LB606	NX8562LB606-BA	NX8562LB606-CA	1560.60	192.10
NX8562LB614	NX8562LB614-BA	NX8562LB614-CA	1561.41	192.00
NX8562LB622	NX8562LB622-BA	NX8562LB622-CA	1562.23	191.90
NX8562LB630	NX8562LB630-BA	NX8562LB630-CA	1563.04	191.80
NX8562LB638	NX8562LB638-BA	NX8562LB638-CA	1563.86	191.70
NX8562LB646	NX8562LB646-BA	NX8562LB646-CA	1564.67	191.60
NX8562LB654	NX8562LB654-BA	NX8562LB654-CA	1565.49	191.50

***1** The value which omitted and computed the 3rd place below the decimal point

ABSOLUTE MAXIMUM RATINGS (T_C = 25 °C, unless otherwise specified)

Parameter	Symbol	Ratings	Unit
Forward Current of LD	I_F	300	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
Operating Case Temperature	T_C	−20 to +65	°C
Storage Temperature	T_{stg}	−40 to +85	°C
Lead Soldering Temperature	T_{sld}	260 (10 sec.)	°C

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

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Laser Set Temperature	T_{set}		20		35	°C
Forward Voltage	V_F	P_f = 20 mW	0.9		1.5	V
Threshold Current	I_{th}			20	40	mA
Optical Output Power from Fiber	P_f	I_F = 167 mA, T_{LD} = T_{set}	20			mW
Threshold Output Power from Fiber	P_{th}	I_F = I_{th}			100	μW
Quantum Efficiency	η		0.13			W/A
★ Peak Emission Wavelength	λ_p	P_f = 20 mW, CW, T_{LD} = T_{set}	1527.6	ITU-T*1	1565.6	nm
Spectral Line Width	$\Delta\nu$	P_f = 20 mW, CW, 3 dB down		1	2	MHz
Side Mode Suppression Ratio	SMSR	P_f = 20 mW, CW	30	35		dB
FM Response	η_{FM}	P_f = 20 mW	50	70		MHz/mA
Relative Intensity Noise	RIN	P_f = 20 mW, 20 MHz to 3 GHz			–150	dB/Hz
Flat frequency response	f_m	P_f = 20 mW, +/–3 dB	1.8			GHz
Polarization Extinction Ratio*2	ext	P_f = 20 mW, CW	15	20		dB

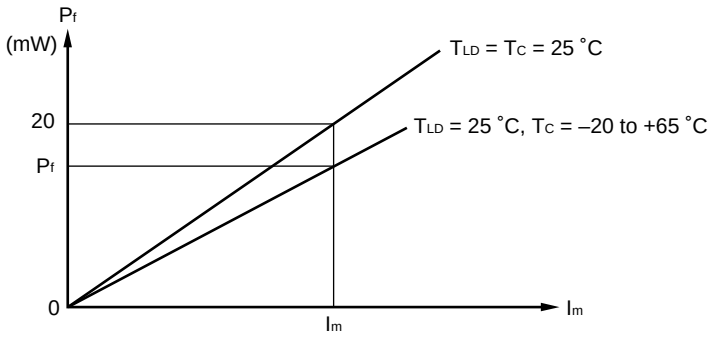
***1** Available for DWDM wavelengths based on ITU-T recommendation.
Please refer to the ORDERING INFORMATION.

***2** Polarization state of LD is aligned parallel to the slow axis.

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

	Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
★	Monitor Current	I_m	P_f = 20 mW, V_R = 5 V	100		2 000	μA
	Dark Current	I_D	V_R = 5 V		2	10	nA
	Tracking Error	γ *1	I_m = const.			0.5	dB

***1** $\gamma = \left| 10 \log \frac{P_f}{20 \text{ mW}} \right|$



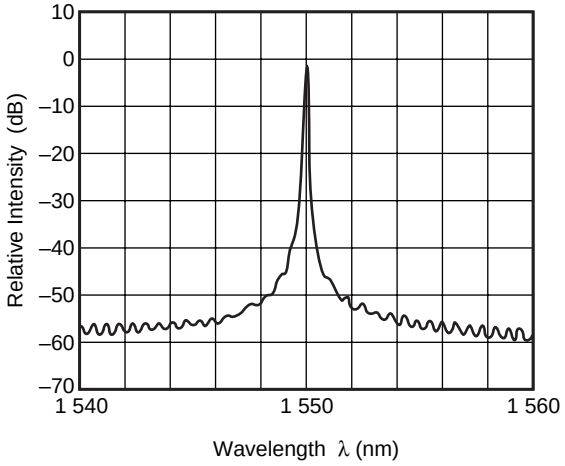
(@ P_f (25 ˚C) = 20 mW)

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

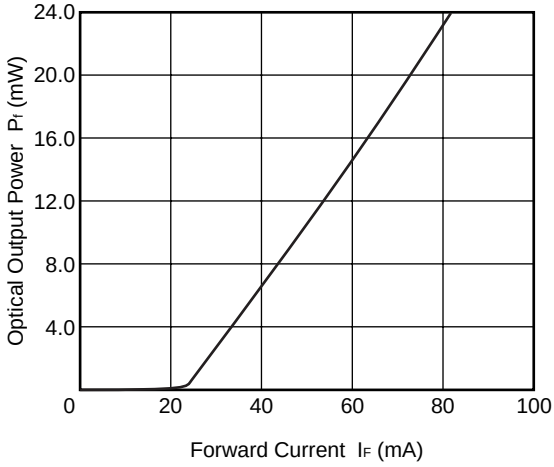
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Thermistor Resistance	R	T_{LD} = 25 °C	9.5	10.0	10.5	kΩ
B Constant	B		3 350	3 450	3 550	K
Cooler Current	I_C	$\Delta T = 65 - T_{set}$, P_f = 20 mW			1.0	A
Cooler Voltage	V_C	$\Delta T = 65 - T_{set}$, P_f = 20 mW			2.0	V

★ **TYPICAL CHARACTERISTICS (T_C = 25 °C, unless otherwise specified)**

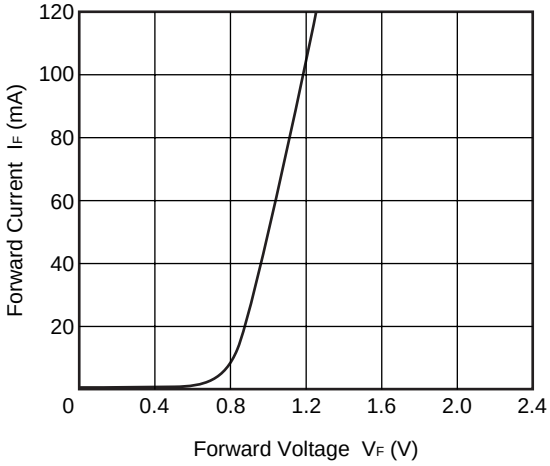
LONGITUDINAL MODE



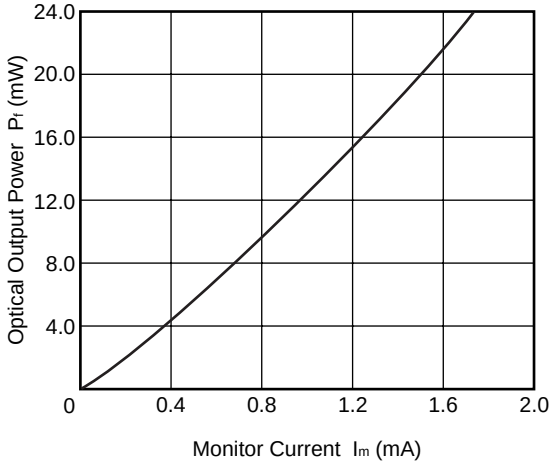
OPTICAL OUTPUT POWER vs. FORWARD CURRENT



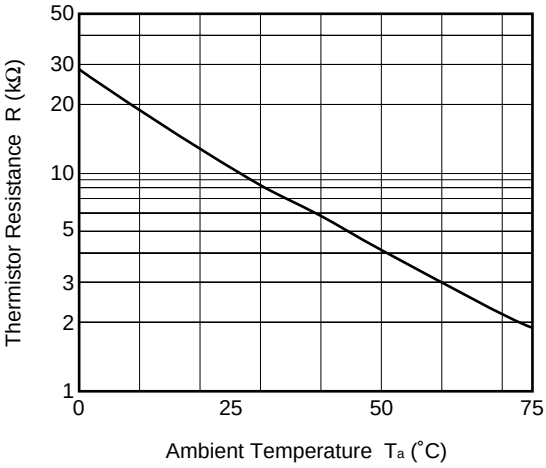
FORWARD CURRENT vs. FORWARD VOLTAGE



OPTICAL OUTPUT POWER vs. MONITOR CURRENT



TYPICAL THERMISTOR RESISTANCE vs. AMBIENT TEMPERATURE



★ DFB-LD FAMILY

Part Number	Absolute Maximum Ratings		Electro-Optical Characteristics (T_C = 25 °C)			Application	Package
	T_C (°C)	T_{stg} (°C)	I_{th} (mA)	P_f (mW)	λ_p (nm)		
			TYP.	MIN.	TYP.		
NX8300BE-CC NX8300CE-CC	0 to +75	−40 to +85	15	2[*1]	1 310	2.5 Gb/s: STM-16 (S-16.1, L-16.1)	Coaxial
NX8303BG-CC	−10 to +85	−40 to +85	15	2[*1]	1 310	622 Mb/s: STM-4 (L-4.1)	Coaxial
NX8503BG-CC	−10 to +85	−40 to +85	15	2[*1]	1 550	156 Mb/s: STM-1 (L-1.2, L-1.3)	Coaxial
						622 Mb/s: STM-4 (L-4.2, L-4.3)	
NX8504BE-CC NX8504CE-CC	−10 to +85	−40 to +85	15	2[*1]	1 550	622 Mb/s: STM-4 (L-4.2, L-4.3)	Coaxial
NX8560LJ-CC	−10 to +70	−40 to +85	6	−2 dBm	1 550[*2]	≤ 10 Gb/s: STM-64	BFY with GPO
NX8562LB	−20 to +65	−40 to +85	20	20	1 550[*2]	CW Light Source for external modulator	BFY
NX8563LB	−20 to +65	−40 to +85	20	10	1 550[*2]	CW Light Source for external modulator	BFY
NX8564LE-CC	−20 to +70	−40 to +85	7	0.6[*1]	1 550[*2]	2.5 Gb/s: STM-16 EA modulator integrated	BFY
NX8565LE-CC	−20 to +70	−40 to +85	7	0.6[*1]	1 550[*2]	2.5 Gb/s: STM-16 EA modulator integrated	BFY
NX8570SA	−20 to +70	−40 to +85	20	20	1 550[*2]	CW Light Source with λ monitoring PD	BFY

***1** TYP.

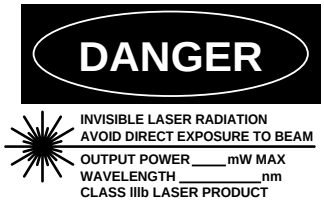
***2** Available for DWDM Wavelength based on ITU-T recommendation

REFERENCE

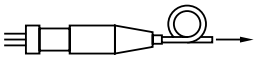
Document Name	Document No.
NEC semiconductor device reliability/quality control system	C11159E
Quality grades on NEC semiconductor devices	C11531E
Semiconductor device mounting technology manual	C10535E
SEMICONDUCTOR SELECTION GUIDE Products & Packages (CD-ROM)	X13769X

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.



SEMICONDUCTOR LASER



AVOID EXPOSURE-Invisible Laser Radiation is emitted from this aperture

NEC Corporation
NEC Building, 7-1, Shiba 5-chome, 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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