DATA SHEET

NEC

LASER DIODE

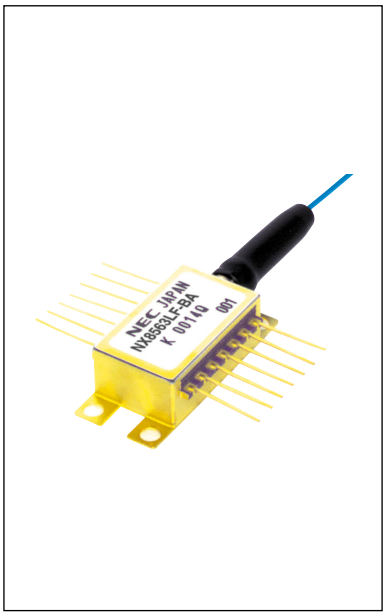
NX8563LF

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

DESCRIPTION

The NX8563LF 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 = 10 mW MIN.
- Available for DWDM wavelengths based on ITU-T recommendations (100 GHz grid, please refer to the **ORDERING INFORMATION**)
- Internal thermo-electric cooler and isolator
- Hermetically sealed 14-pin butterfly package
- Polarization maintain fiber pigtail

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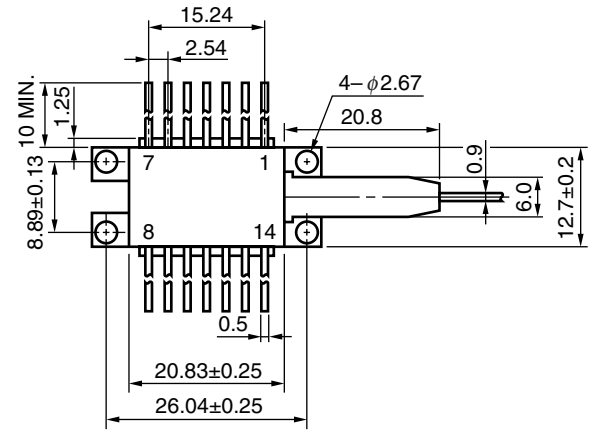
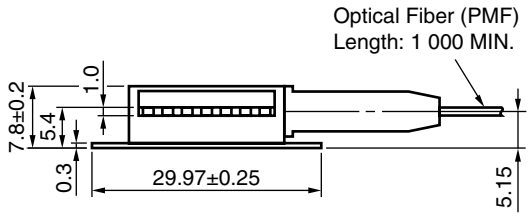
Date Published September 2005 CP(K)
Printed in Japan

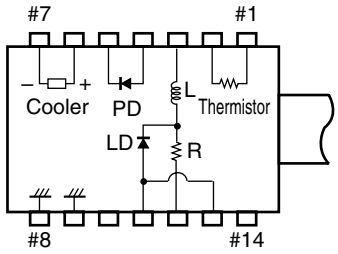
The mark ★ shows major revised points.

★ **PACKAGE DIMENSIONS (UNIT: mm)**





TOP VIEW

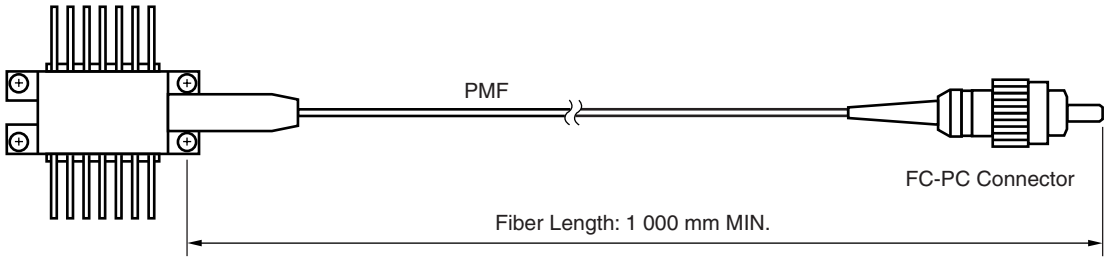


PIN CONNECTIONS

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

OPTICAL FIBER DIMENSIONS (UNIT: mm)

Parameter	Specification	Unit
Outer Diameter	0.9±0.1	mm
Minimum Fiber Bending Radius	30	mm
Fiber Length	1 000 MIN.	mm



★ ORDERING INFORMATION

NX8563LF □□□ -BA

- With FC-PC Connector
- Wavelength Code : Refer to **Table A**

Table A: DWDM wavelength based on ITU-T recommendations (@T_{LD} = T_{set}) (1/2)

Wavelength Code	ITU-T Wavelength*1 (nm)	Frequency (THz)	Wavelength Code	ITU-T Wavelength*1 (nm)	Frequency (THz)
279	1 527.99	196.20	485	1 548.51	193.60
287	1 528.77	196.10	493	1 549.31	193.50
295	1 529.55	196.00	501	1 550.11	193.40
303	1 530.33	195.90	509	1 550.91	193.30
311	1 531.11	195.80	517	1 551.72	193.20
318	1 531.89	195.70	525	1 552.52	193.10
326	1 532.68	195.60	533	1 553.32	193.00
334	1 533.46	195.50	541	1 554.13	192.90
342	1 534.25	195.40	549	1 554.94	192.80
350	1 535.03	195.30	557	1 555.74	192.70
358	1 535.82	195.20	565	1 556.55	192.60
366	1 536.60	195.10	573	1 557.36	192.50
373	1 537.39	195.00	581	1 558.17	192.40
381	1 538.18	194.90	589	1 558.98	192.30
389	1 538.97	194.80	597	1 559.79	192.20
397	1 539.76	194.70	606	1 560.60	192.10
405	1 540.55	194.60	614	1 561.41	192.00
413	1 541.34	194.50	622	1 562.23	191.90
421	1 542.14	194.40	630	1 563.04	191.80
429	1 542.93	194.30	638	1 563.86	191.70
437	1 543.73	194.20	646	1 564.67	191.60
445	1 544.52	194.10	654	1 565.49	191.50
453	1 545.32	194.00	663	1 566.31	191.40
461	1 546.11	193.90	671	1 567.13	191.30
469	1 546.91	193.80	679	1 567.95	191.20
477	1 547.71	193.70	687	1 568.77	191.10

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

Table A: DWDM wavelength based on ITU-T recommendations (@T_{LD} = T_{set}) (2/2)

Wavelength Code	ITU-T Wavelength*1 (nm)	Frequency (THz)	Wavelength Code	ITU-T Wavelength*1 (nm)	Frequency (THz)
695	1 569.59	191.00	912	1 591.25	188.40
704	1 570.41	190.90	921	1 592.10	188.30
712	1 571.23	190.80	929	1 592.94	188.20
720	1 572.06	190.70	937	1 593.79	188.10
728	1 572.88	190.60	946	1 594.64	188.00
737	1 573.71	190.50	954	1 595.48	187.90
745	1 574.54	190.40	963	1 596.33	187.80
753	1 575.36	190.30	971	1 597.18	187.70
761	1 576.19	190.20	980	1 598.04	187.60
770	1 577.02	190.10	988	1 598.89	187.50
778	1 577.85	190.00	997	1 599.74	187.40
786	1 578.68	189.90	6006	1 600.60	187.30
795	1 579.51	189.80	6014	1 601.45	187.20
803	1 580.35	189.70	6023	1 602.31	187.10
811	1 581.18	189.60	6031	1 603.16	187.00
820	1 582.01	189.50	6040	1 604.02	186.90
828	1 582.85	189.40	6048	1 604.88	186.80
836	1 583.69	189.30	6057	1 605.74	186.70
845	1 584.52	189.20	6066	1 606.60	186.60
853	1 585.36	189.10	6074	1 607.46	186.50
862	1 586.20	189.00	6083	1 608.32	186.40
870	1 587.04	188.90	6091	1 609.19	186.30
878	1 587.88	188.80	6100	1 610.05	186.20
887	1 588.72	188.70	6109	1 610.92	186.10
895	1 589.56	188.60	6117	1 611.78	186.00
904	1 590.41	188.50			

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

ABSOLUTE MAXIMUM RATINGS

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 +70	°C
Storage Temperature	T_{stg}	–40 to +85	°C
Lead Soldering Temperature	T_{sld}	260 (10 sec.)	°C

ELECTRO-OPTICAL CHARACTERISTICS ($T_{LD} = T_{set}$, T_C = –20 to +70°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Laser Set Temperature	T_{set}		20		35	°C
Forward Voltage	V_F	P_f = 10 mW		1.2	2.5	V
Forward Current	I_F	P_f = 10 mW		70	125	mA
Threshold Current	I_{th}			20	40	mA
Optical Output Power from Fiber	P_f	I_F = 125 mA, $T_{LD} = T_{set}$	10			mW
Peak Emission Wavelength	λ_p	P_f = 10 mW, CW, $T_{LD} = T_{set}$	1 527.99	ITU-T *1	1 611.78	nm
Spectral Line Width	$\Delta\nu$	P_f = 10 mW, CW, 3 dB down		1	2	MHz
Side Mode Suppression Ratio	SMSR	P_f = 10 mW, CW	33	45		dB
Relative Intensity Noise	RIN	P_f = 10 mW, 20 MHz to 3 GHz			–150	dB/Hz
Polarization Extinction Ratio *2	ext	P_f = 10 mW, CW	20			dB

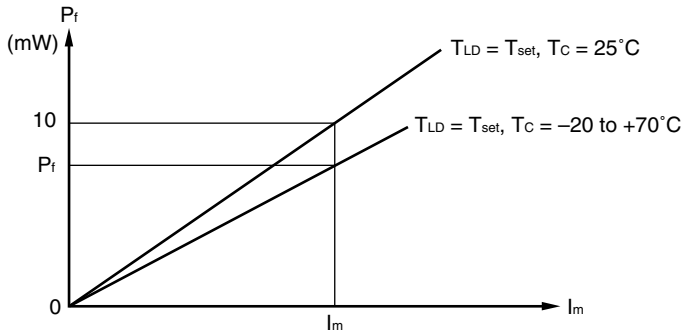
***1** Available for DWDM wavelengths based on ITU-T recommendations
(100 GHz grid, please refer to the **ORDERING INFORMATION**)

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

ELECTRO-OPTICAL CHARACTERISTICS
(Applicable to Monitor PD: $T_{LD} = T_{set}$, T_C = –20 to +70°C)

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

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



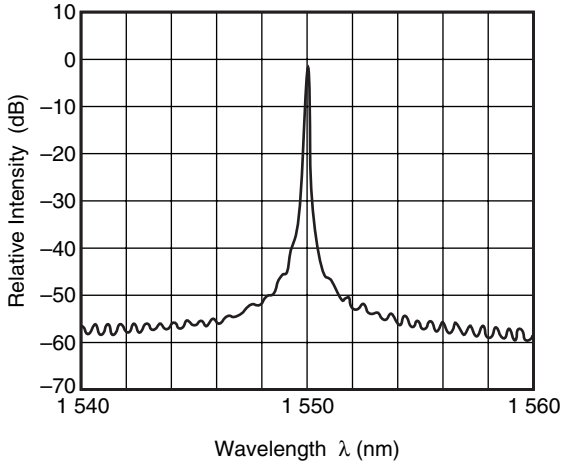
(@ P_f (25˚C) = 10 mW)

ELECTRO-OPTICAL CHARACTERISTICS
(Applicable to Thermistor and TEC: $T_{LD} = T_{set}$, T_C = –20 to +70°C)

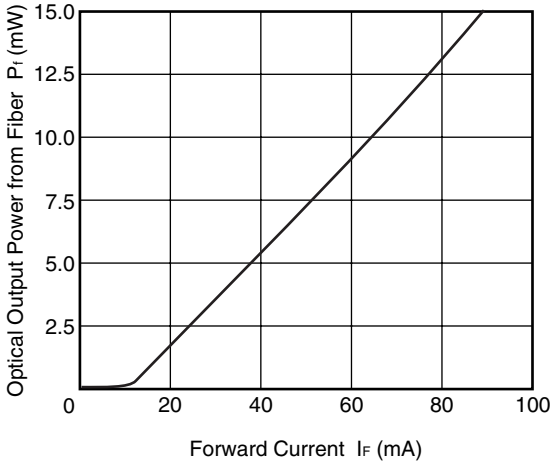
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Thermistor Resistance	R	T_{LD} = 25°C	9.5	10.0	10.5	kΩ
B Constant	B		3 350	3 450	3 550	K
Cooler Current	I_C	$\Delta T = 70 - T_{set}$, P_f = 10 mW			1.0	A
Cooler Voltage	V_C	$\Delta T = 70 - T_{set}$, P_f = 10 mW			2.0	V

TYPICAL CHARACTERISTICS (T_{LD} = T_{set}, unless otherwise specified)

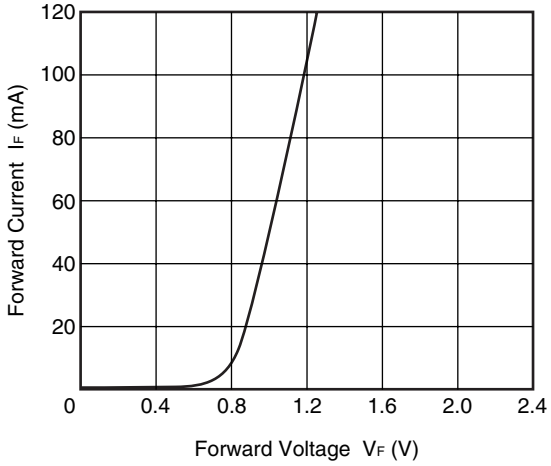
SPECTRUM



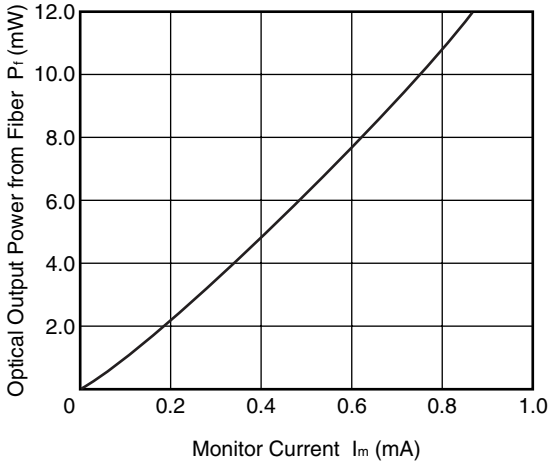
OPTICAL OUTPUT POWER FROM FIBER vs. FORWARD CURRENT



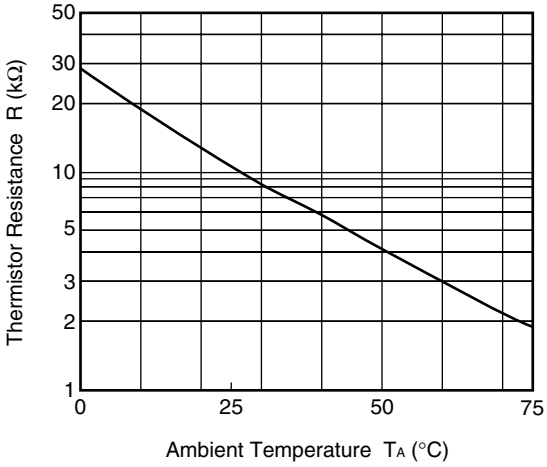
FORWARD CURRENT vs. FORWARD VOLTAGE



OPTICAL OUTPUT POWER FROM FIBER vs. MONITOR CURRENT



THERMISTOR RESISTANCE vs. AMBIENT TEMPERATURE



Remark The graphs indicate nominal characteristics.

REFERENCE

Document Name	Document No.
OPTICAL SEMICONDUCTOR DEVICES FOR FIBEROPTIC COMMUNICATIONS SELECTION GUIDE	PL10161E
Opto-Electronics Devices Pamphlet	PX10160E

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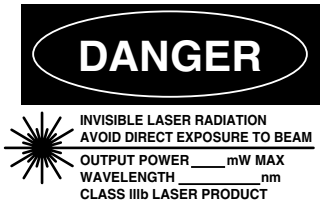

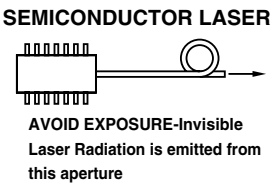

Warning Laser Beam	A laser beam is emitted from this diode during operation. The laser beam, visible or invisible, directly or indirectly, may cause injury to the eye or loss of eyesight. • Do not look directly into the laser beam. • Avoid exposure to the laser beam, any reflected or collimated beam.
Caution GaAs Products	This product uses gallium arsenide (GaAs). GaAs vapor and powder are hazardous to human health if inhaled or ingested, so please observe the following points. • Follow related laws and ordinances when disposing of the product. If there are no applicable laws and/or ordinances, dispose of the product as recommended below. 1. Commission a disposal company able to (with a license to) collect, transport and dispose of materials that contain arsenic and other such industrial waste materials. 2. Exclude the product from general industrial waste and household garbage, and ensure that the product is controlled (as industrial waste subject to special control) up until final disposal. • Do not burn, destroy, cut, crush, or chemically dissolve the product. • Do not lick the product or in any way allow it to enter the mouth.
Caution Optical Fiber	A glass-fiber is attached on the product. Handle with care. • When the fiber is broken or damaged, handle carefully to avoid injury from the damaged part or fragments.

▶**For further information, please contact**

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