

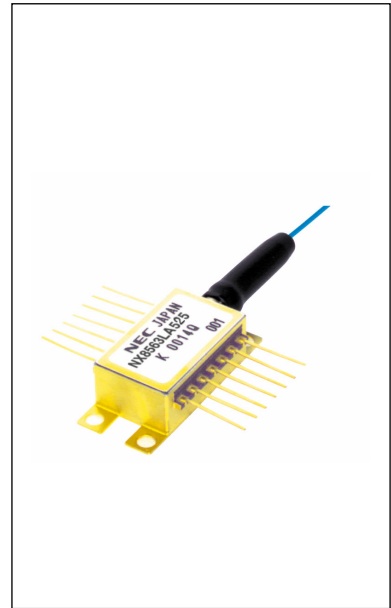
**1 550 nm InGaAsP MQW-DFB LASER DIODE MODULE
2.5 Gb/s DIRECTLY MODULATION LIGHT SOURCE FOR DWDM APPLICATIONS****DESCRIPTION**

The NX8563LA Series is a 1 550 nm Multiple Quantum Well (MQW) structured Distributed Feed-Back (DFB) laser diode module with Single Mode Fiber.

It is designed as directly modulation light source and ideal for optical transmission systems. The device is available for Dense Wavelength Division Multiplexing (DWDM) wavelengths based on ITU-T recommendations, enabling a wide range of applications.

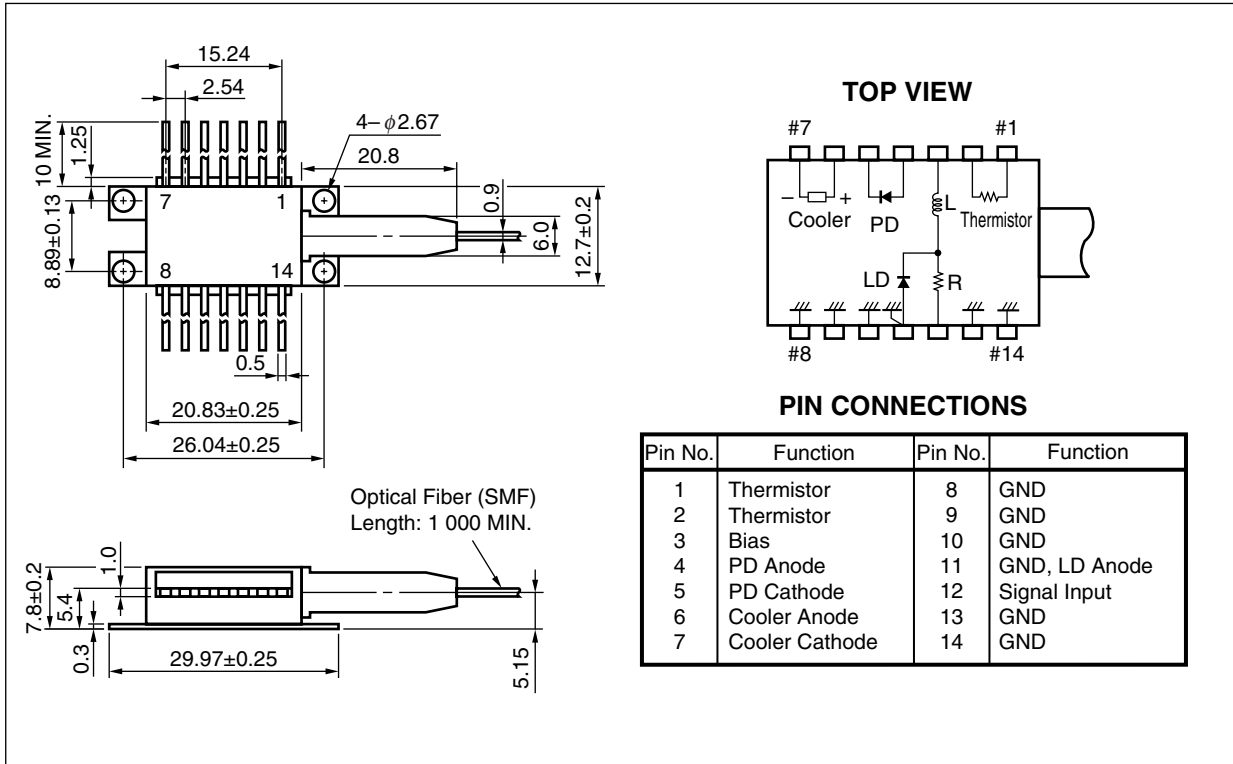
FEATURES

- Peak output power $P_r = 10$ 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
- Single mode fiber pigtail
- Wide operation temperature range



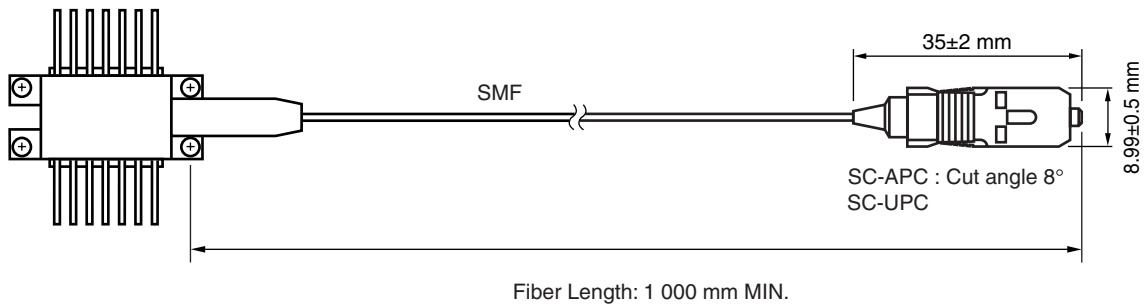
The information in this document is subject to change without notice. Before using this document, please confirm that this is the latest version.
Not all devices/types available in every country. Please check with local NEC Compound Semiconductor Devices representative for availability and additional information.

★ PACKAGE DIMENSIONS (UNIT: mm)



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

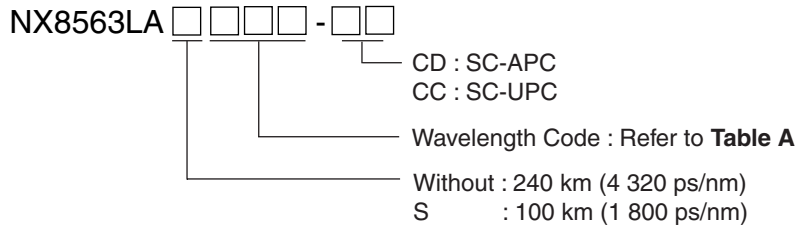


Table A: DWDM wavelength based on ITU-T recommendations (@T_{LD} = T_{set})

Wavelength Code	ITU-T Wavelength* ¹ (nm)	Frequency (THz)	Wavelength Code	ITU-T Wavelength* ¹ (nm)	Frequency (THz)
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			
421	1 542.14	194.40			
429	1 542.93	194.30			
437	1 543.73	194.20			
445	1 544.52	194.10			
453	1 545.32	194.00			
461	1 546.11	193.90			
469	1 546.91	193.80			
477	1 547.71	193.70			
485	1 548.51	193.60			
493	1 549.31	193.50			
501	1 550.11	193.40			

*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 +85	°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 $+85^\circ\text{C}$)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Laser Set Temperature	T_{set}		30		45	°C
Forward Voltage	V_F	$P_f = 10$ mW	0.9		2.0	V
Threshold Current	I_{th}			20	40	mA
Optical Output Power from Fiber	P_f	$I_F = I_{op}$, $T_{LD} = T_{set}$	10			mW
Operation Current	I_{op}				125	mA
Threshold Output Power	P_{th}	$I_F = I_{th}$			100	μW
Quantum Efficiency	η	CW	0.142	0.17		W/A
Peak Emission Wavelength	λ_p	$P_f = 10$ mW, CW, $T_{LD} = T_{set}$	1 530	ITU-T ^{*1}	1 562	nm
Spectral Line Width	$\Delta\nu$	$P_f = 10$ mW, CW, 3 dB down		1	5	MHz
Side Mode Suppression Ratio	SMSR	$P_f = 10$ mW, under modulation	30	35		dB
Input Impedance	ZIN			25		Ω
Relative Intensity Noise	RIN	$P_f = 10$ mW, 20 MHz to 3 GHz			-140	dB/Hz
Rise and Fall Time	t_r / t_f	20-80%/80-20%, $T_C = 25^\circ\text{C}$			120	ps
Input Return Loss	S_{11}	f = 50 MHz to 3 GHz	6			dB
		f = 3 GHz to 6 GHz	3			
Band Width	BW	-3 dB, $P_f = 10$ mW	2.5			GHz
Dispersion Penalty	DP	$T_C = 25^\circ\text{C}^2$			2.0	dB

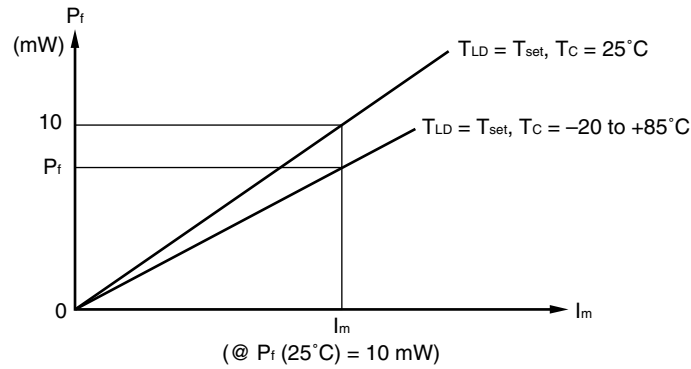
*1 Available for DWDM wavelengths based on ITU-T recommendations (100 GHz grid, please refer to the **ORDERING INFORMATION**)

*2 2.48832 Gb/s, PRBS 2²³-1, duty cycle, Extinction Ratio ≥ 8.5 dB, BER = 10⁻¹⁰, NX8563LAS: 1 800 ps/nm (100 km), NX8563LA: 4 320 ps/nm (240 km)

ELECTRO-OPTICAL CHARACTERISTICS
 (Applicable to Monitor PD: $T_{LD} = T_{set}$, $T_C = -20$ to $+85^\circ\text{C}$)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Monitor Current	I_m	$P_f = 10 \text{ mW}$, $V_R = 5 \text{ V}$	100		2 000	μA
Dark Current	I_D	$V_R = 5 \text{ V}$			10	nA
Tracking Error	γ^{*1}	$I_m = \text{const.}$			0.6	dB

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



ELECTRO-OPTICAL CHARACTERISTICS
 (Applicable to Thermistor and TEC: $T_{LD} = T_{set}$, $T_C = -20$ to $+85^\circ\text{C}$)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Thermistor Resistance	R	$T_{LD} = 25^\circ\text{C}$	9.5	10.0	10.5	$\text{k}\Omega$
B Constant	B		3 350	3 450	3 550	K
Cooler Current	I_C	$\Delta T = 85 - T_{set}$, $P_f = 10 \text{ mW}$			1.2	A
Cooler Voltage	V_C	$\Delta T = 85 - T_{set}$, $P_f = 10 \text{ mW}$			2.4	V

REFERENCE

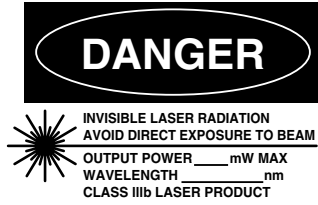
Document Name	Document No.
OPTICAL SEMICONDUCTOR DEVICES FOR FIBEROPTIC COMMUNICATIONS SELECTION GUIDE	PL10161E
Opto-Electronics Devices Pamphlet	PX10160E

When the product(s) listed in this document is subject to any applicable import or export control laws and regulation of the authority having competent jurisdiction, such product(s) shall not be imported or exported without obtaining the import or export license.

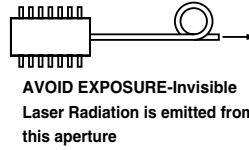
- **The information in this document is current as of September, 2005. The information is subject to change without notice. For actual design-in, refer to the latest publications of NEC's data sheets or data books, etc., for the most up-to-date specifications of NEC semiconductor products. Not all products and/or types are available in every country. Please check with an NEC sales representative for availability and additional information.**
 - No part of this document may be copied or reproduced in any form or by any means without prior written consent of NEC. NEC assumes no responsibility for any errors that may appear in this document.
 - NEC does not assume any liability for infringement of patents, copyrights or other intellectual property rights of third parties by or arising from the use of NEC semiconductor products listed in this document or any other liability arising from the use of such products. No license, express, implied or otherwise, is granted under any patents, copyrights or other intellectual property rights of NEC or others.
 - Descriptions of circuits, software and other related information in this document are provided for illustrative purposes in semiconductor product operation and application examples. The incorporation of these circuits, software and information in the design of customer's equipment shall be done under the full responsibility of customer. NEC assumes no responsibility for any losses incurred by customers or third parties arising from the use of these circuits, software and information.
 - While NEC endeavours to enhance the quality, reliability and safety of NEC semiconductor products, customers agree and acknowledge that the possibility of defects thereof cannot be eliminated entirely. To minimize risks of damage to property or injury (including death) to persons arising from defects in NEC semiconductor products, customers must incorporate sufficient safety measures in their design, such as redundancy, fire-containment, and anti-failure features.
 - NEC semiconductor products are classified into the following three quality grades:
 "Standard", "Special" and "Specific". The "Specific" quality grade applies only to semiconductor products developed based on a customer-designated "quality assurance program" for a specific application. The recommended applications of a semiconductor product depend on its quality grade, as indicated below. Customers must check the quality grade of each semiconductor product before using it in a particular application.
 "Standard": Computers, office equipment, communications equipment, test and measurement equipment, audio and visual equipment, home electronic appliances, machine tools, personal electronic equipment and industrial robots
 "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)
 "Specific": Aircraft, aerospace equipment, submersible repeaters, nuclear reactor control systems, life support systems and medical equipment for life support, etc.
- The quality grade of NEC semiconductor products is "Standard" unless otherwise expressly specified in NEC's data sheets or data books, etc. If customers wish to use NEC semiconductor products in applications not intended by NEC, they must contact an NEC sales representative in advance to determine NEC's willingness to support a given application.
- (Note)
- (1) "NEC" as used in this statement means NEC Corporation, NEC Compound Semiconductor Devices, Ltd. and also includes its majority-owned subsidiaries.
 - (2) "NEC semiconductor products" means any semiconductor product developed or manufactured by or for NEC (as defined above).

M8E 00.4-0110

SAFETY INFORMATION ON THIS PRODUCT



SEMICONDUCTOR LASER



<p>Warning Laser Beam</p>	<p>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.</p> <ul style="list-style-type: none"> • Do not look directly into the laser beam. • Avoid exposure to the laser beam, any reflected or collimated beam.
<p>Caution GaAs Products</p>	<p>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.</p> <ul style="list-style-type: none"> • 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. <ol style="list-style-type: none"> 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.
<p>Caution Optical Fiber</p>	<p>A glass-fiber is attached on the product. Handle with care.</p> <ul style="list-style-type: none"> • When the fiber is broken or damaged, handle carefully to avoid injury from the damaged part or fragments.

► For further information, please contact

NEC Compound Semiconductor Devices, Ltd. <http://www.ncsd.necel.com/>

E-mail: salesinfo@ml.ncsd.necel.com (sales and general)

techinfo@ml.ncsd.necel.com (technical)

Sales Division TEL: +81-44-435-1573 FAX: +81-44-435-1579

NEC Compound Semiconductor Devices Hong Kong Limited

E-mail: ncsd-hk@elhk.nec.com.hk (sales, technical and general)

Hong Kong Head Office TEL: +852-3107-7303 FAX: +852-3107-7309

Taipei Branch Office TEL: +886-2-8712-0478 FAX: +886-2-2545-3859

Korea Branch Office TEL: +82-2-558-2120 FAX: +82-2-558-5209

NEC Electronics (Europe) GmbH <http://www.ee.nec.de/>

TEL: +49-211-6503-0 FAX: +49-211-6503-1327

California Eastern Laboratories, Inc. <http://www.cel.com/>

TEL: +1-408-988-3500 FAX: +1-408-988-0279