



LASER DIODE

NX8563LA Series

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

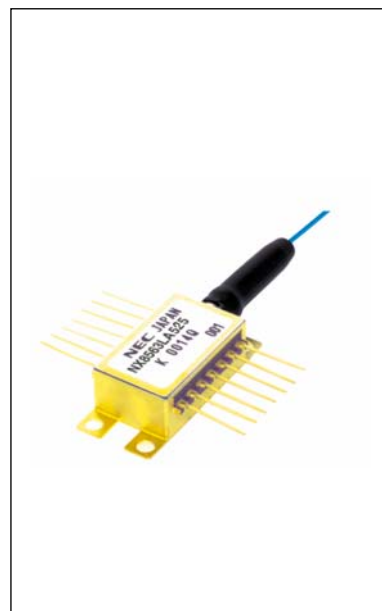
DESCRIPTION

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.

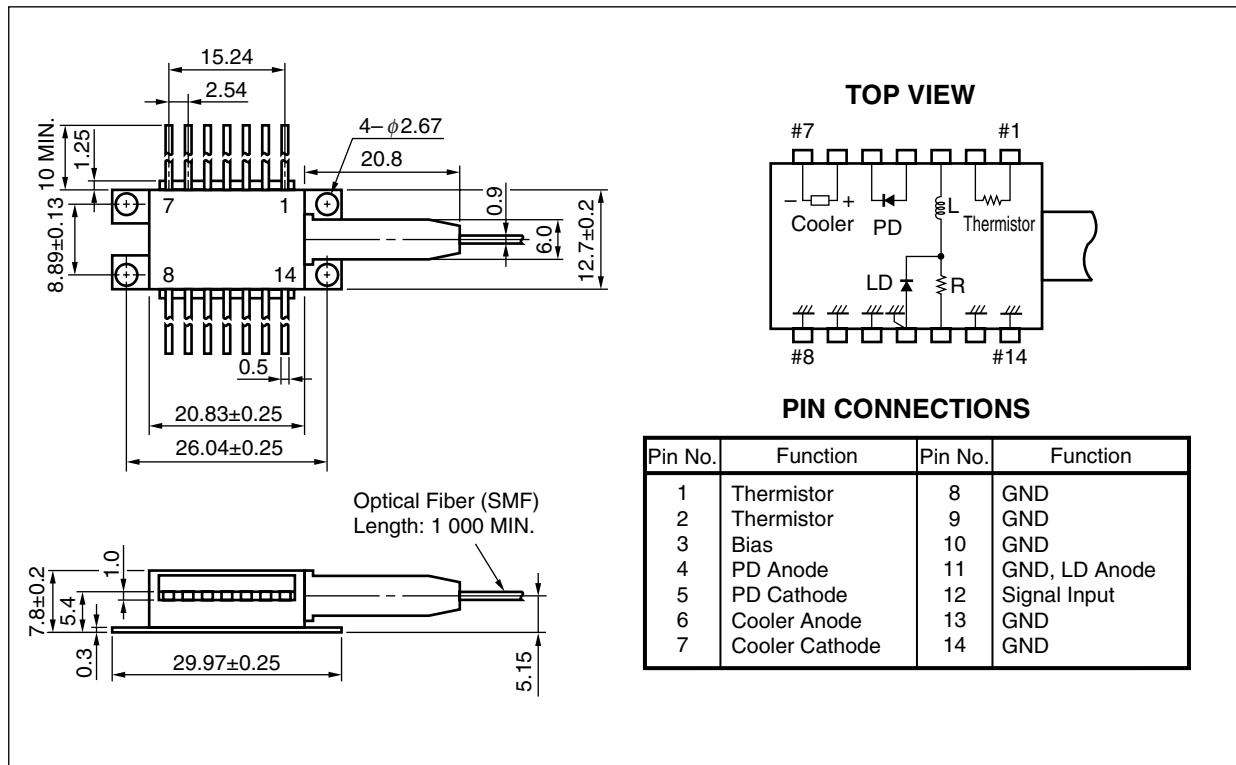
FEATURES

- Peak output power $P_r = 10 \text{ mW MIN.}$
- 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



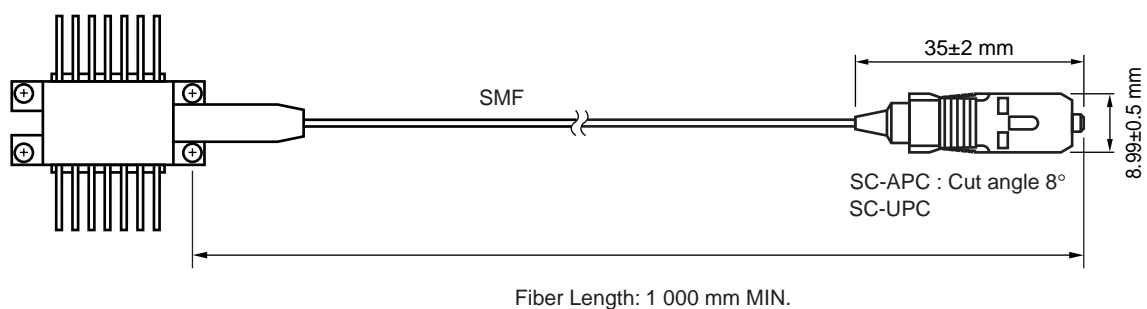
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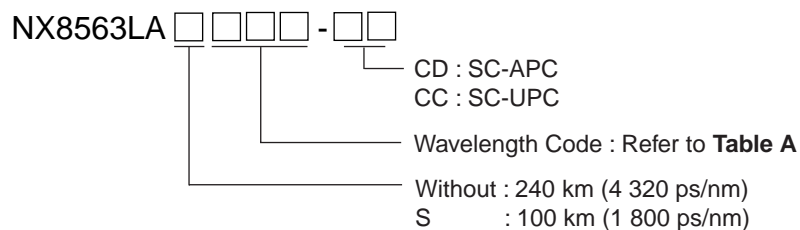
★ PACKAGE DIMENSIONS (UNIT: mm)



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**)

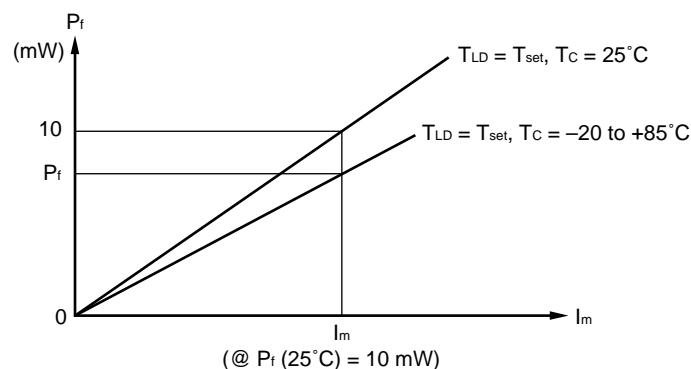
*2 2.48832 Gb/s, PRBS $2^{23}-1$, duty cycle, Extinction Ratio ≥ 8.5 dB, BER = 10^{-10} ,
NX8563LAS: 1 800 ps/nm (100 km), NX8563LA: 4 320 ps/nm (240 km)

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

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



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

Subject: Compliance with EU Directives

CEL certifies, to its knowledge, that semiconductor and laser products detailed below are compliant with the requirements of European Union (EU) Directive 2002/95/EC Restriction on Use of Hazardous Substances in electrical and electronic equipment (RoHS) and the requirements of EU Directive 2003/11/EC Restriction on Penta and Octa BDE.

CEL Pb-free products have the same base part number with a suffix added. The suffix –A indicates that the device is Pb-free. The –AZ suffix is used to designate devices containing Pb which are exempted from the requirement of RoHS directive (*). In all cases the devices have Pb-free terminals. All devices with these suffixes meet the requirements of the RoHS directive.

This status is based on CEL's understanding of the EU Directives and knowledge of the materials that go into its products as of the date of disclosure of this information.

Restricted Substance per RoHS	Concentration Limit per RoHS (values are not yet fixed)	Concentration contained in CEL devices	
		-A	-AZ
Lead (Pb)	< 1000 PPM	Not Detected	(*)
Mercury	< 1000 PPM	Not Detected	
Cadmium	< 100 PPM	Not Detected	
Hexavalent Chromium	< 1000 PPM	Not Detected	
PBB	< 1000 PPM	Not Detected	
PBDE	< 1000 PPM	Not Detected	

If you should have any additional questions regarding our devices and compliance to environmental standards, please do not hesitate to contact your local representative.

Important Information and Disclaimer: Information provided by CEL on its website or in other communications concerning the substance content of its products represents knowledge and belief as of the date that it is provided. CEL bases its knowledge and belief on information provided by third parties and makes no representation or warranty as to the accuracy of such information. Efforts are underway to better integrate information from third parties. CEL has taken and continues to take reasonable steps to provide representative and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. CEL and CEL suppliers consider certain information to be proprietary, and thus CAS numbers and other limited information may not be available for release.

In no event shall CEL's liability arising out of such information exceed the total purchase price of the CEL part(s) at issue sold by CEL to customer on an annual basis.

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