

**1 550 nm CW LIGHT SOURCE  
InGaAsP MQW-DFB LASER DIODE MODULE  
WITH WAVELENGTH MONITOR****DESCRIPTION**

The NX8570SA is a 1 550 nm Multiple Quantum Well (MQW) structured Distributed Feed-Back (DFB) laser diode module with wavelength monitor function.

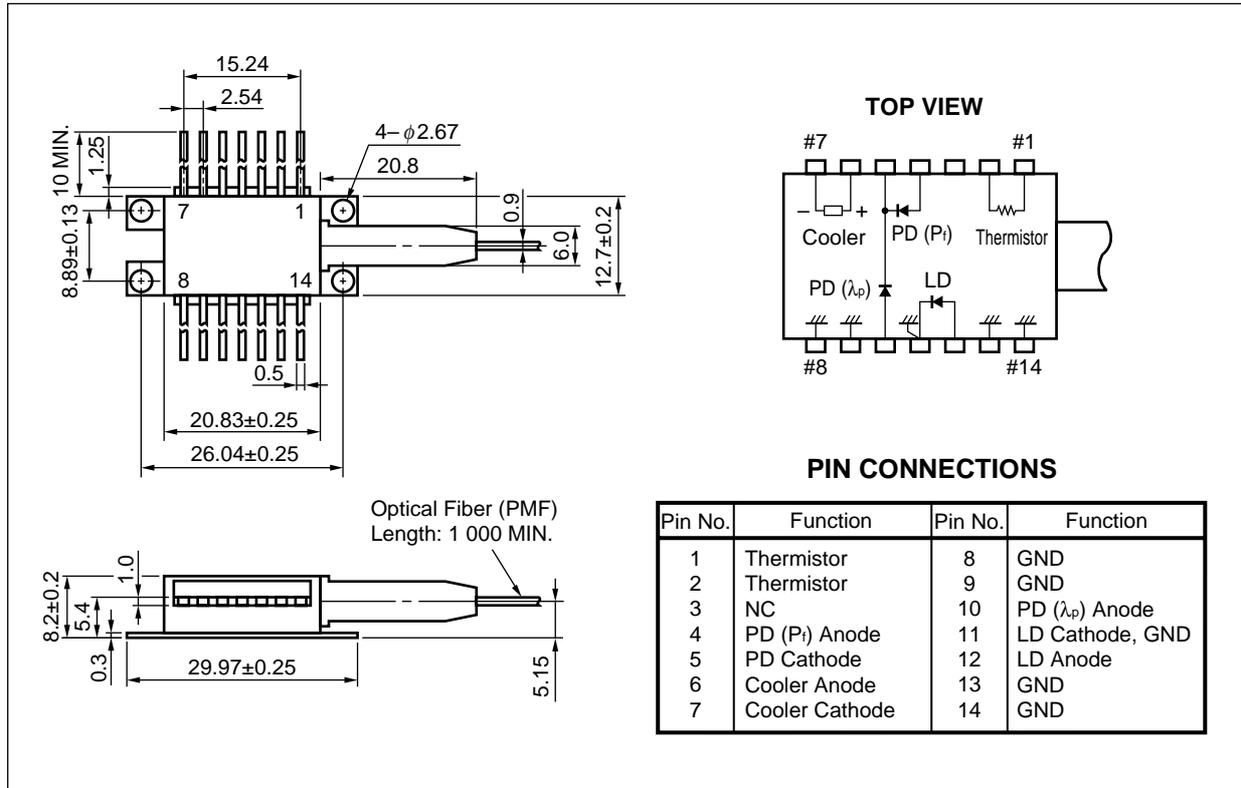
This device is designed as CW light source and ideal for transmission systems in which external modulators are used.

**FEATURES**

- Wavelength monitor function (Etalon Filter, Wavelength monitor PD)
- Output power  $P_r = 20$  mW MIN.
- Available for DWDM wavelengths based on ITU-T recommendations (100 GHz grid, refer to ORDERING INFORMATION)
- Internal thermo-electric cooler and isolator
- Hermetically sealed 14-pin butterfly package
- Polarization maintain fiber pigtail

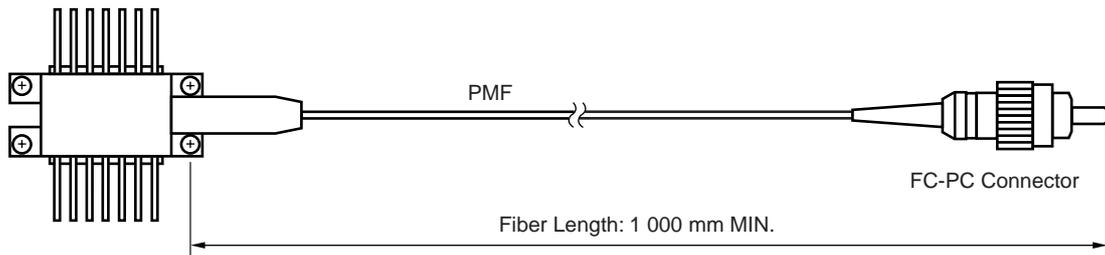
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Not all devices/types available in every country. Please check with local NEC representative for availability and additional information.

PACKAGE DIMENSIONS (Unit: mm)



★ OPTICAL FIBER CHARACTERISTICS

Parameter	Specification	Unit
Outer Diameter	0.9±0.1	mm
Minimum Fiber Bending Radius	40	mm
Fiber Length	1 000 MIN.	mm



★ ORDERING INFORMATION

Part Number		ITU-T Wavelength <sup>*1</sup> (nm)	Frequency (THz)
With FC-PC Connector (Standard)	With SC-PC Connector (Option)		
NX8570SA303-BA	NX8570SA303-CA	1530.33	195.90
NX8570SA311-BA	NX8570SA311-CA	1531.11	195.80
NX8570SA318-BA	NX8570SA318-CA	1531.89	195.70
NX8570SA326-BA	NX8570SA326-CA	1532.68	195.60
NX8570SA334-BA	NX8570SA334-CA	1533.46	195.50
NX8570SA342-BA	NX8570SA342-CA	1534.25	195.40
NX8570SA350-BA	NX8570SA350-CA	1535.03	195.30
NX8570SA358-BA	NX8570SA358-CA	1535.82	195.20
NX8570SA366-BA	NX8570SA366-CA	1536.60	195.10
NX8570SA373-BA	NX8570SA373-CA	1537.39	195.00
NX8570SA381-BA	NX8570SA381-CA	1538.18	194.90
NX8570SA389-BA	NX8570SA389-CA	1538.97	194.80
NX8570SA397-BA	NX8570SA397-CA	1539.76	194.70
NX8570SA405-BA	NX8570SA405-CA	1540.55	194.60
NX8570SA413-BA	NX8570SA413-CA	1541.34	194.50
NX8570SA421-BA	NX8570SA421-CA	1542.14	194.40
NX8570SA429-BA	NX8570SA429-CA	1542.93	194.30
NX8570SA437-BA	NX8570SA437-CA	1543.73	194.20
NX8570SA445-BA	NX8570SA445-CA	1544.52	194.10
NX8570SA453-BA	NX8570SA453-CA	1545.32	194.00
NX8570SA461-BA	NX8570SA461-CA	1546.11	193.90
NX8570SA469-BA	NX8570SA469-CA	1546.91	193.80
NX8570SA477-BA	NX8570SA477-CA	1547.71	193.70
NX8570SA485-BA	NX8570SA485-CA	1548.51	193.60
NX8570SA493-BA	NX8570SA493-CA	1549.31	193.50
NX8570SA501-BA	NX8570SA501-CA	1550.11	193.40
NX8570SA509-BA	NX8570SA509-CA	1550.91	193.30
NX8570SA517-BA	NX8570SA517-CA	1551.72	193.20
NX8570SA525-BA	NX8570SA525-CA	1552.52	193.10
NX8570SA533-BA	NX8570SA533-CA	1553.32	193.00
NX8570SA541-BA	NX8570SA541-CA	1554.13	192.90
NX8570SA549-BA	NX8570SA549-CA	1554.94	192.80
NX8570SA557-BA	NX8570SA557-CA	1555.74	192.70
NX8570SA565-BA	NX8570SA565-CA	1556.55	192.60

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

Part Number		ITU-T Wavelength <sup>*1</sup> (nm)	Frequency (THz)
With FC-PC Connector (Standard)	With SC-PC Connector (Option)		
NX8570SA573-BA	NX8570SA573-CA	1557.36	192.50
NX8570SA581-BA	NX8570SA581-CA	1558.17	192.40
NX8570SA589-BA	NX8570SA589-CA	1558.98	192.30
NX8570SA597-BA	NX8570SA597-CA	1559.79	192.20
NX8570SA606-BA	NX8570SA606-CA	1560.60	192.10
NX8570SA614-BA	NX8570SA614-CA	1561.41	192.00
NX8570SA622-BA	NX8570SA622-CA	1562.23	191.90
NX8570SA630-BA	NX8570SA630-CA	1563.04	191.80
NX8570SA638-BA	NX8570SA638-CA	1563.86	191.70
NX8570SA646-BA	NX8570SA646-CA	1564.67	191.60
NX8570SA654-BA	NX8570SA654-CA	1565.49	191.50

\*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**  
 ( $T_{LD} = 25\text{ °C}$ ,  $T_C = -5\text{ to }+70\text{ °C}$ , unless otherwise specified)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Laser Set Temperature	$T_{set}$		20		35	°C
Forward Voltage	$V_F$	$P_f = 20\text{ mW}$	0.9		2.5	V
Threshold Current	$I_{th}$			20	40	mA
Optical Output Power from Fiber	$P_f$	$I_F = 167\text{ mA}$ , $T_{LD} = T_{set}$	20			mW
Threshold Output Power from Fiber	$P_{th}$	$I_F = I_{th}$			100	μW
Peak Emission Wavelength	$\lambda_p$	$P_f = 20\text{ mW}$ , CW, $T_{LD} = T_{set}$	1 530	ITU-T <sup>*1</sup>	1 566	nm
Wavelength Stability	—	$T_{LD} = T_{set}$ , applicable to wavelength monitor, E.O.L.	-35		+35	pm
Spectral Line Width	$\Delta\nu$	$P_f = 20\text{ mW}$ , CW, 3 dB down			20	MHz
Side Mode Suppression Ratio	SMSR	$P_f = 20\text{ mW}$ , CW	33	45		dB
Relative Intensity Noise	RIN	$P_f = 20\text{ mW}$ , 20 MHz to 3 GHz			-145	dB/Hz
Isolation	$I_s$		30			dB
Polarization Extinction Ratio <sup>*2</sup>	ext	$P_f = 20\text{ mW}$ , CW	15			dB

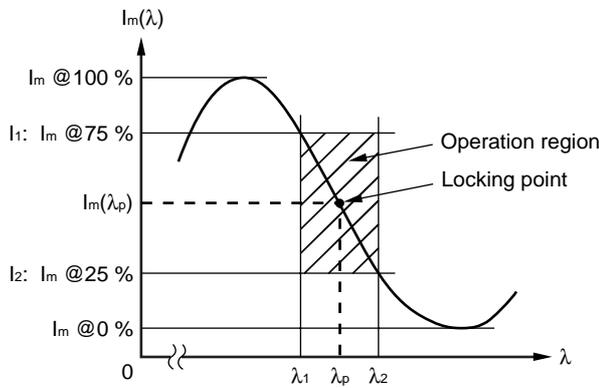
\*1 Available for DWDM wavelengths based on ITU-T recommendations (100 GHz grid).  
 Please refer to ORDERING INFORMATION.

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

★ **ELECTRO-OPTICAL CHARACTERISTICS**  
 (Applicable to Monitor PD:  $T_{LD} = T_{set}$ ,  $T_c = -5$  to  $+70$  °C)

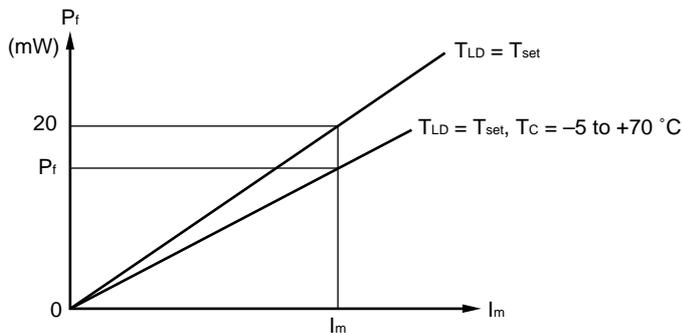
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Monitor Current ( $P_f$ Monitor)	$I_m(P_f)$	$P_f = 20$ mW, $V_R = 5$ V	30		300	$\mu A$
Monitor Current ( $\lambda_p$ Monitor)	$I_m(\lambda_p)$	$P_f = 20$ mW, $V_R = 5$ V, Locking point	15		150	$\mu A$
Operation Region <sup>*1</sup>	$I_m(\lambda)$		25		75	%
	$ \lambda_1 - \lambda_2 $		90			pm
Discrimination Slope <sup>*1</sup>	$\eta_\lambda$		0.15			$\mu A/pm$
Dark Current	$I_D$	$V_R = 5$ V		2	10	nA
Tracking Error	$\gamma$ <sup>*2</sup>	$I_m = \text{const.}$			0.5	dB

\*1 Operation region, Discrimination slope



$$\eta_\lambda = \frac{|I_1 - I_2|}{|\lambda_1 - \lambda_2|} \quad [\mu A/pm]$$

\*2 Tracking error:  $\gamma$



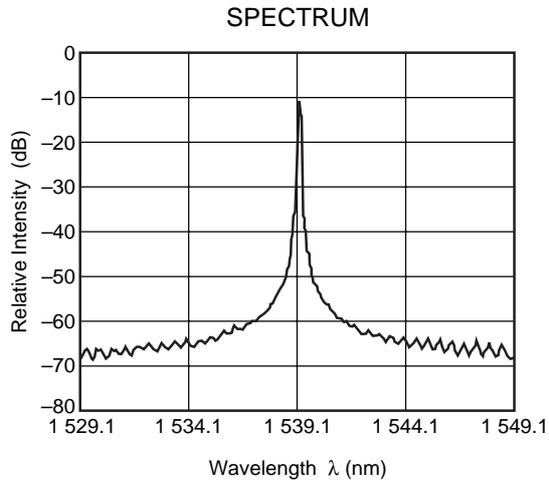
$$\gamma = \left| 10 \log \frac{P_f}{20} \right| \quad [dB]$$

**ELECTRO-OPTICAL CHARACTERISTICS**  
 (Applicable to Thermistor and TEC:  $T_{LD} = 25$  °C,  $T_c = -5$  to  $+70$  °C)

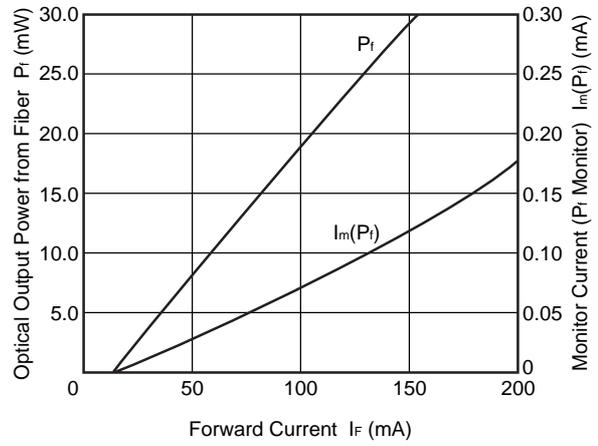
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Thermistor Resistance	R	$T_{LD} = 25$ °C	9.5	10.0	10.5	k $\Omega$
B Constant	B		3 350	3 450	3 550	K
Cooler Current	$I_c$	$\Delta T = 70 - T_{set}$ , $P_f = 20$ mW			1.5	A
Cooler Voltage	$V_c$	$\Delta T = 70 - T_{set}$ , $P_f = 20$ mW			4.5	V

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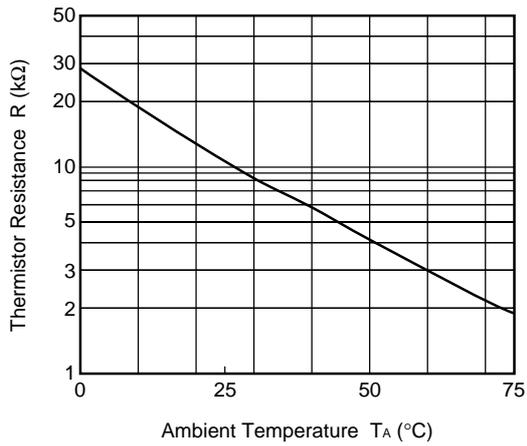
★ TYPICAL CHARACTERISTICS ( $T_{LD} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)



OPTICAL OUTPUT POWER FROM FIBER, MONITOR CURRENT ( $P_f$  MONITOR) vs. FORWARD CURRENT



THERMISTOR RESISTANCE vs. AMBIENT TEMPERATURE



**Remark** The graphs indicate nominal characteristics.

★ DFB-LD FAMILY

Part Number	Absolute Maximum Ratings		Electro-Optical Characteristics (T <sub>c</sub> = 25 °C)			Application	Package
	T <sub>c</sub> (°C)	T <sub>stg</sub> (°C)	I <sub>th</sub> (mA)	P <sub>f</sub> (mW)	λ <sub>p</sub> (nm)		
			TYP.	MIN.	TYP.		
NX8300BE-CC NX8300CE-CC	0 to +75	-40 to +85	15	2 <sup>*1</sup>	1 310	2.5 Gb/s: STM-16 (S-16.1, L-16.1)	Coaxial
NX8303BG-CC NX8303CG-CC	-10 to +85	-40 to +85	15	2 <sup>*1</sup>	1 310	622 Mb/s: STM-4 (L-4.1)	Coaxial
NX8503BG-CC NX8503CG-CC	-10 to +85	-40 to +85	15	2 <sup>*1</sup>	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 <sup>*1</sup>	1 550	622 Mb/s: STM-4 (L-4.2, L-4.3)	Coaxial
NX8560LJ-CC	-20 to +70	-40 to +85	6	-2 dBm	1 550	≤ 10 Gb/s: STM-64	BFY with GPO™
NX8562LB	-20 to +65	-40 to +85	20	20	1 550 <sup>*2</sup>	CW Light Source for external modulator	BFY
NX8563LB	-20 to +65	-40 to +85	20	10	1 550 <sup>*2</sup>	CW Light Source for external modulator	BFY
NX8564LE-CC	-20 to +70	-40 to +85	7	0.6 <sup>*1</sup>	1 550 <sup>*2</sup>	2.5 Gb/s: STM-16 EA modulator integrated	BFY
NX8565LE-CC	-20 to +70	-40 to +85	7	0.6 <sup>*1</sup>	1 550 <sup>*2</sup>	2.5 Gb/s: STM-16 EA modulator integrated	BFY
NX8570SA	-20 to +70	-40 to +85	20	20	1 550 <sup>*2</sup>	CW Light Source with λ monitoring PD	BFY
NX8571SA	-20 to +70	-40 to +85	20	10	1 550 <sup>*2</sup>	CW Light Source with λ monitoring PD	BFY

\*1 TYP.

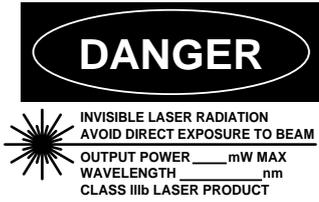
\*2 Available for DWDM Wavelengths based on ITU-T recommendations

**REFERENCE**

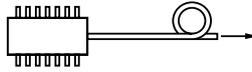
Document Name	Document No.
Optical semiconductor devices for fiberoptic communications Selection Guide	P12480E
Opto-Electronics Devices Pamphlet	P13623E
Opto-Electronics Devices (CD-ROM)	P12944X
NEC semiconductor device reliability/quality control system	C11159E
Quality grades on NEC semiconductor devices	C11531E
SEMICONDUCTOR SELECTION GUIDE –Products and Packages–	X13769E

[MEMO]

SAFETY INFORMATION ON THIS PRODUCT



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.

<p><b>Warning</b> 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"> <li>• Do not look directly into the laser beam.</li> <li>• Avoid exposure to the laser beam, any reflected or collimated beam.</li> </ul>
<p><b>Caution</b> GaAs Products</p>	<p>The product contains gallium arsenide, GaAs.                  GaAs vapor and powder are hazardous to human health if inhaled or ingested.</p> <ul style="list-style-type: none"> <li>• Do not destroy or burn the product.</li> <li>• Do not cut or cleave off any part of the product.</li> <li>• Do not crush or chemically dissolve the product.</li> <li>• Do not put the product in the mouth.</li> </ul> <p>Follow related laws and ordinances for disposal. The product should be excluded from general industrial waste or household garbage.</p>
<p><b>Caution</b> Optical Fiber</p>	<p>A glass-fiber is attached on the product. Handle with care.</p> <ul style="list-style-type: none"> <li>• When the fiber is broken or damaged, handle carefully to avoid injury from the damaged part or fragments.</li> </ul>

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