

PRELIMINARY DATA SHEET

NEC

1550 nm CW LIGHT SOURCE InGaAsP MQW-DFB LASER DIODE MODULE WITH WAVELENGTH MONITOR

NX8570SA NX8570SC

FEATURES

- **WAVELENGTH MONITOR FUNCTION**
(Etalon Filter, Wavelength monitor PD)
- **OUTPUT POWER:**
 $P_r = 20 \text{ mW MIN}$
- **WAVELENGTH SELECTABLE FOR ITU-T STANDARDS**
(50 GHz Grid)
- **INTERNAL THERMOELECTRIC COOLER AND ISOLATOR**
- **INDUSTRY STANDARD HERMETICALLY SEALED 14-PIN BUTTERFLY PACKAGE**
- **POLARIZATION MAINTAIN FIBER PIGTAIL**

DESCRIPTION

The NX8570SA and NX8570SC are 1550 nm Multiple Quantum Well (MQW) structured Distributed Feed-Back laser diode with wavelength monitor function. This device is designed as a CW light source and is ideal for transmission systems in which external modulators are used.

ELECTRO-OPTICAL CHARACTERISTICS ($T_{LD} = 25^\circ\text{C}$, $T_c = -5$ to $+70^\circ\text{C}$, unless otherwise specified)

PART NUMBER			NX8570SA, NX8570SC		
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX
T_{SET}	Laser Set Temperature	$^\circ\text{C}$	20		35
V_F	Forward Voltage, $P_r = 20 \text{ mW}$	V	0.9		2.5
I_{TH}	Threshold Current	mA		20	40
P_r	Optical Output Power from Fiber, $I_F = 167 \text{ mA}$, $T_{LD} = T_{SET}$	mW	20		
P_{TH}	Threshold Output Power from Fiber, $I_F = I_{TH}$	μW			100
λ_p	Peak Emission Wavelength, $P_r = 20 \text{ mW}$, CW, $T_{LD} = T_{SET}$	nm	1530	ITU-T ¹	1566
	Wavelength Stability, $T_{LD} = T_{SET}$, applicable to wavelength monitor, E.O.L.	pm	-20		+20
$\Delta\nu$	Spectral Line Width, $P_r = 20 \text{ mW}$, CW, 3 dB down	MHz			20
SMSR	Side mode Suppression Ratio, $P_r = 20 \text{ mW}$, CW	dB	33	45	
RIN	Relative Intensity Noise, $P_r = 20 \text{ mW}$, 20 MHz to 3 GHz	dB/Hz			-145
ext	Polarization Extinction Ratio ² , $P_r = 20 \text{ mW}$, CW	dB	15		
ISOL	Isolation	dB	30		

Notes:

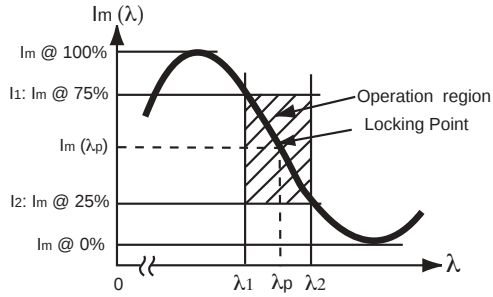
1. Wavelength selectable for ITU-T standards (50 GHz grid). Please refer to ordering information.
2. Polarization state of LD is aligned parallel to the slow axis.

ELECTRO-OPTICAL CHARACTERISTICS (Applicable to Monitor PD: $T_{LD} = T_{set}$, $T_c = -5$ to $+70^\circ\text{C}$)

PART NUMBER			NX8570SA, NX8570SC		
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX
$I_m(P_f)$	Monitor Current (P_f Monitor), $P_f = 20$ mW, $V_R = 5$ V	μA	30		300
$I_m(\lambda_p)$	Monitor Current (λ_p Monitor), $P_f = 20$ mW, $V_R = 5$ V, Peak value	μA	15		150
$I_m(\lambda)$	Operation region ¹	%	25		75
$ \lambda_1 - \lambda_2 $		nm	90		
$\eta\lambda$	Discrimination slope ¹	$\mu\text{A}/\text{pm}$	0.15		
I_D	Dark Current, $V_R = 5$ V	nA		2	10
γ^2	Tracking Error, $I_m = \text{const.}$	dB			0.5

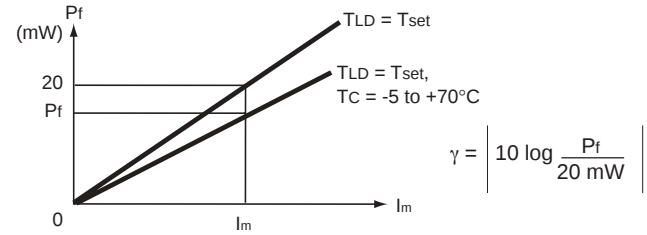
Notes:

1. Operation region, Discrimination slope



$$\eta\lambda = \left| \frac{I_1 - I_2}{\lambda_1 - \lambda_2} \right| [\mu\text{A}/\text{pm}]$$

2. Tracking error: γ



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

PART NUMBER			NX8570SA, NX8570SC		
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX
R	Thermistor Resistance	k Ω	9.5	10.0	10.5
B	B Constant	K	3350	3450	3550
I_C	Cooler Current, $\Delta T = 70 - T_{SET}$, $P_f = 20$ mW	A			1.5
V_C	Cooler Voltage, $\Delta T = 70 - T_{SET}$, $P_f = 20$ mW	V			4.5

ABSOLUTE MAXIMUM RATINGS¹

($T_A = 25^\circ\text{C}$, unless otherwise specified)

SYMBOLS	PARAMETERS	UNITS	RATINGS
I_F	Forward Current of LD	mA	300
V_R	Reverse Voltage of LD	V	2.0
I_F	Forward Current of PD	mA	10
V_R	Reverse Voltage of PD	V	20
T_C	Operating Case Temperature	$^\circ\text{C}$	-20 to +70
T_{STG}	Storage Temperature	$^\circ\text{C}$	-40 to +85
T_{SLD}	Lead Soldering Temperature (10 s)	$^\circ\text{C}$	260

Note:

1. Operation in excess of any one of these parameters may result in permanent damage.

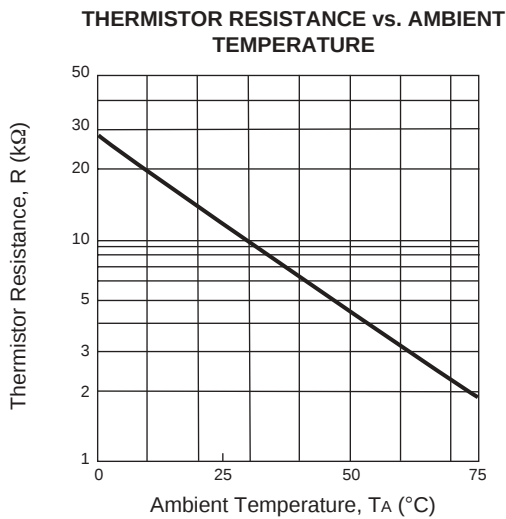
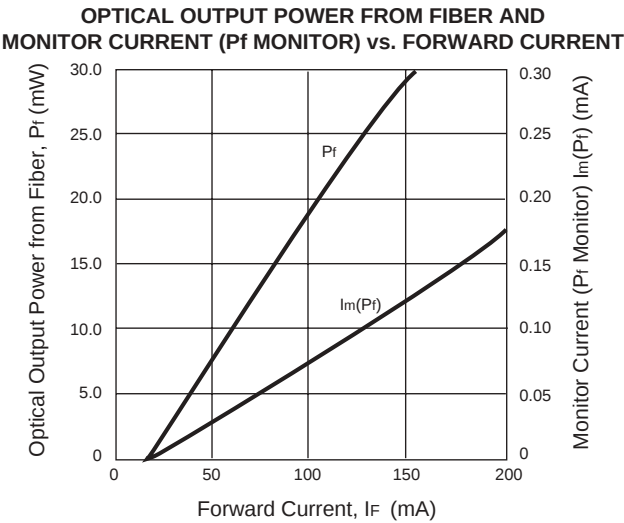
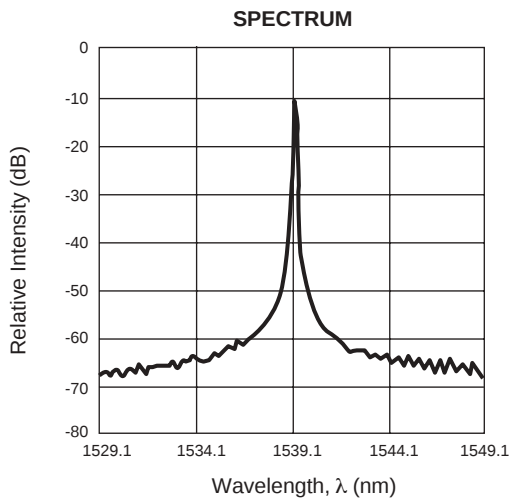
ORDERING INFORMATION

Part Number				ITU-T Wavelength ¹ (nm)	Frequency (THz)
With FC-PC Connector (Standard)	With SC-PC Connector (Option)	With FC-PC Connector (Standard)	With SC-PC Connector (Option)		
NX8570SA303-BA	NX8570SA303-CA	NX8570SC303-BA	NX8570SC303-CA	1530.33	195.90
NX8570SA311-BA	NX8570SA311-CA	NX8570SC311-BA	NX8570SC311-CA	1531.11	195.80
NX8570SA318-BA	NX8570SA318-CA	NX8570SC318-BA	NX8570SC318-CA	1531.89	195.70
NX8570SA326-BA	NX8570SA326-CA	NX8570SC326-BA	NX8570SC326-CA	1532.68	195.60
NX8570SA334-BA	NX8570SA334-CA	NX8570SC334-BA	NX8570SC334-CA	1533.46	195.50
NX8570SA342-BA	NX8570SA342-CA	NX8570SC342-BA	NX8570SC342-CA	1534.25	195.40
NX8570SA350-BA	NX8570SA350-CA	NX8570SC350-BA	NX8570SC350-CA	1535.03	195.30
NX8570SA358-BA	NX8570SA358-CA	NX8570SC358-BA	NX8570SC358-CA	1535.82	195.20
NX8570SA366-BA	NX8570SA366-CA	NX8570SC366-BA	NX8570SC366-CA	1536.60	195.10
NX8570SA373-BA	NX8570SA373-CA	NX8570SC373-BA	NX8570SC373-CA	1537.39	195.00
NX8570SA381-BA	NX8570SA381-CA	NX8570SC381-BA	NX8570SC381-CA	1538.18	194.90
NX8570SA389-BA	NX8570SA389-CA	NX8570SC389-BA	NX8570SC389-CA	1538.97	194.80
NX8570SA397-BA	NX8570SA397-CA	NX8570SC397-BA	NX8570SC397-CA	1539.76	194.70
NX8570SA405-BA	NX8570SA405-CA	NX8570SC405-BA	NX8570SC405-CA	1540.55	194.60
NX8570SA413-BA	NX8570SA413-CA	NX8570SC413-BA	NX8570SC413-CA	1541.34	194.50
NX8570SA421-BA	NX8570SA421-CA	NX8570SC421-BA	NX8570SC421-CA	1542.14	194.40
NX8570SA429-BA	NX8570SA429-CA	NX8570SC429-BA	NX8570SC429-CA	1542.93	194.30
NX8570SA437-BA	NX8570SA437-CA	NX8570SC437-BA	NX8570SC437-CA	1543.73	194.20
NX8570SA445-BA	NX8570SA445-CA	NX8570SC445-BA	NX8570SC445-CA	1544.52	194.10
NX8570SA453-BA	NX8570SA453-CA	NX8570SC453-BA	NX8570SC453-CA	1545.32	194.00
NX8570SA461-BA	NX8570SA461-CA	NX8570SC461-BA	NX8570SC461-CA	1546.11	193.90
NX8570SA469-BA	NX8570SA469-CA	NX8570SC469-BA	NX8570SC469-CA	1546.91	193.80
NX8570SA477-BA	NX8570SA477-CA	NX8570SC477-BA	NX8570SC477-CA	1547.71	193.70
NX8570SA485-BA	NX8570SA485-CA	NX8570SC485-BA	NX8570SC485-CA	1548.51	193.60
NX8570SA493-BA	NX8570SA493-CA	NX8570SC493-BA	NX8570SC493-CA	1549.31	193.50
NX8570SA501-BA	NX8570SA501-CA	NX8570SC501-BA	NX8570SC501-CA	1550.11	193.40
NX8570SA509-BA	NX8570SA509-CA	NX8570SC509-BA	NX8570SC509-CA	1550.91	193.30
NX8570SA517-BA	NX8570SA517-CA	NX8570SC517-BA	NX8570SC517-CA	1551.72	193.20
NX8570SA525-BA	NX8570SA525-CA	NX8570SC525-BA	NX8570SC525-CA	1552.52	193.10
NX8570SA533-BA	NX8570SA533-CA	NX8570SC533-BA	NX8570SC533-CA	1553.32	193.00
NX8570SA541-BA	NX8570SA541-CA	NX8570SC541-BA	NX8570SC541-CA	1554.13	192.90
NX8570SA549-BA	NX8570SA549-CA	NX8570SC549-BA	NX8570SC549-CA	1554.94	192.80
NX8570SA557-BA	NX8570SA557-CA	NX8570SC557-BA	NX8570SC557-CA	1555.74	192.70
NX8570SA565-BA	NX8570SA565-CA	NX8570SC565-BA	NX8570SC565-CA	1556.55	192.60
NX8570SA573-BA	NX8570SA573-CA	NX8570SC573-BA	NX8570SC573-CA	1557.36	192.50
NX8570SA581-BA	NX8570SA581-CA	NX8570SC581-BA	NX8570SC581-CA	1558.17	192.40
NX8570SA589-BA	NX8570SA589-CA	NX8570SC589-BA	NX8570SC589-CA	1558.98	192.30
NX8570SA597-BA	NX8570SA597-CA	NX8570SC597-BA	NX8570SC597-CA	1559.79	192.20
NX8570SA606-BA	NX8570SA606-CA	NX8570SC606-BA	NX8570SC606-CA	1560.60	192.10
NX8570SA614-BA	NX8570SA614-CA	NX8570SC614-BA	NX8570SC614-CA	1561.41	192.00
NX8570SA622-BA	NX8570SA622-CA	NX8570SC622-BA	NX8570SC622-CA	1562.23	191.90
NX8570SA630-BA	NX8570SA630-CA	NX8570SC630-BA	NX8570SC630-CA	1563.04	191.80
NX8570SA638-BA	NX8570SA638-CA	NX8570SC638-BA	NX8570SC638-CA	1563.86	191.70
NX8570SA646-BA	NX8570SA646-CA	NX8570SC646-BA	NX8570SC646-CA	1564.67	191.60
NX8570SA654-BA	NX8570SA654-CA	NX8570SC654-BA	NX8570SC654-CA	1565.49	191.50

Note:

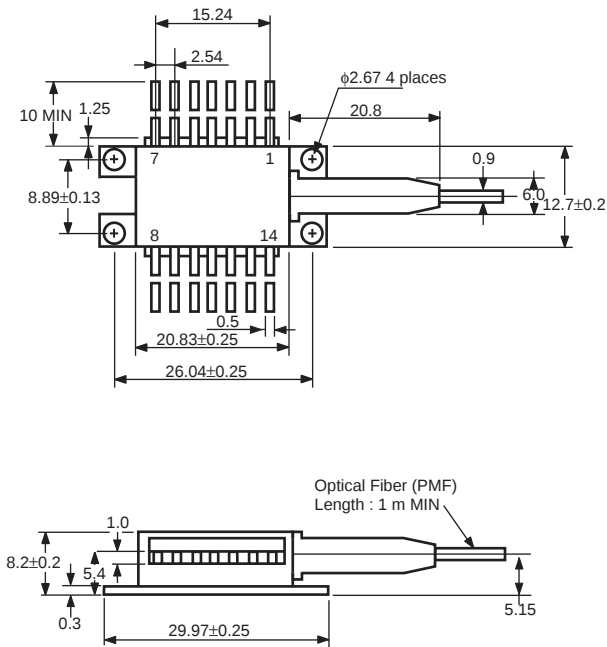
1. The third digit after decimal point is deleted.

TYPICAL PERFORMANCE CURVES (T_{LD} = 25°C, unless otherwise specified)

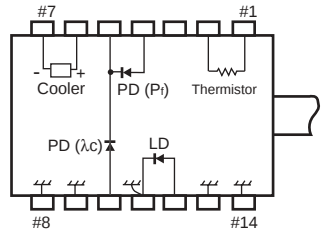


Remark: The graphs indicate nominal characteristics.

OUTLINE DIMENSIONS (Units in mm)

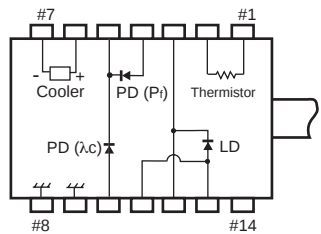


NX8570SA PIN CONNECTIONS



PIN No.	FUNCTION	PIN No.	FUNCTION
1	THERMISTOR	8	GND
2	THERMISTOR	9	GND
3	NC	10	PD (λ_p) ANODE
4	PD (P_f) ANODE	11	LD CATHODE, GND
5	PD CATHODE	12	LD ANODE
6	COOLER ANODE	13	GND
7	PD CATHODE	14	GND

NX8570SC PIN CONNECTIONS



PIN No.	FUNCTION	PIN No.	FUNCTION
1	THERMISTOR	8	GND
2	THERMISTOR	9	GND
3	LD CATHODE	10	PD (λ_p) ANODE
4	PD (P_f) ANODE	11	LD ANODE
5	PD CATHODE	12	LD CATHODE
6	COOLER ANODE	13	LD ANODE
7	COOLER CATHODE	14	NC

OPTICAL FIBER CHARACTERISTICS (Units in mm)

PARAMETERS	SPECIFICATIONS
Outer Diameter	0.9±0.1
Minimum Fiber Bending Radius	40
Fiber Length	1000 MIN

