

To our customers,

Old Company Name in Catalogs and Other Documents

On April 1st, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

Renesas Electronics website: <http://www.renesas.com>

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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Phase-out/Discontinued

NX8570SCxxxQ-BA

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

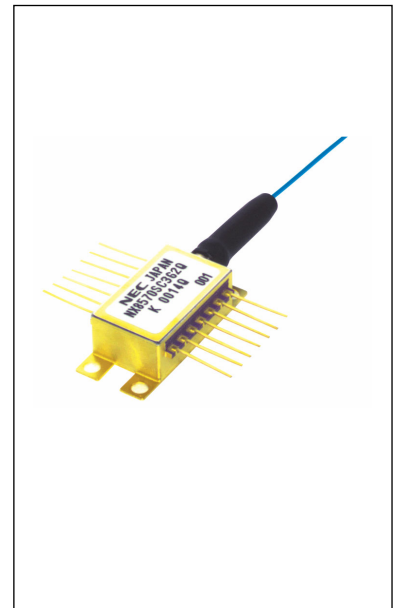
DESCRIPTION

The NX8570SCxxxQ-BA is a 1 550 nm Multiple Quantum Well (MQW) structured Distributed Feed-Back (DFB) laser diode module with wavelength monitor function. This device is temperature tunable over 8×50 GHz channels. Available at both C-band (1 530.334 to 1 565.087 nm) and L-band (1 565.496 to 1 608.760 nm) ITU-T grid wavelengths.

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

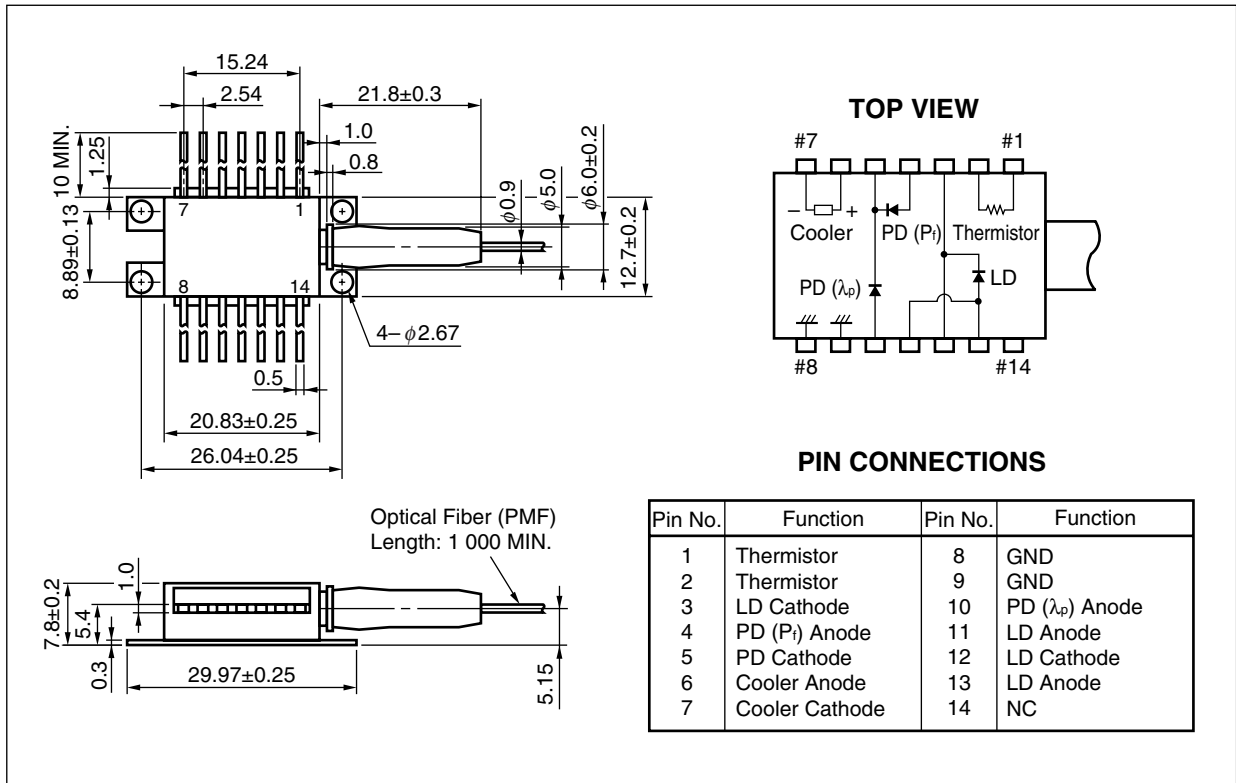
FEATURES

- Wavelength monitor function (Etalon Filter, Wavelength monitor PD)
- Optical output power $P_r = 20$ mW MIN.
- Available for DWDM wavelengths based on ITU-T recommendations (50 GHz grid, please refer to the **ORDERING INFORMATION**)
- 8 channel wavelength tunable capability for 50 GHz-spacing
- Internal thermo-electric cooler and isolator
- Hermetically sealed 14-pin butterfly package
- Polarization maintain fiber pigtail



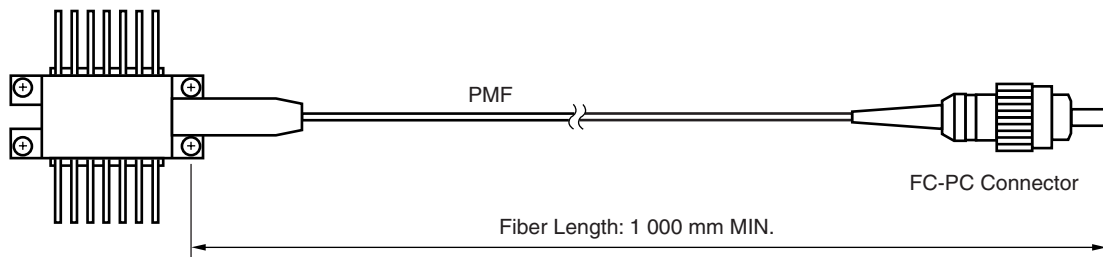
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★ PACKAGE DIMENSIONS (UNIT : mm)



OPTICAL FIBER CHARACTERISTICS

Parameter	Specification	Unit
Outer Diameter	0.9±0.1	mm
Minimum Fiber Bending Radius	25	mm
Fiber Length	1 000 MIN.	mm



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 ($T_{LD} = T_{set}$, $T_C = -5$ to $+70^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Laser Set Temperature	T_{set}	8 channel tunable	5		55	°C
Forward Voltage	V_F	$P_f = 20$ mW	0.9	1.2	2.5	V
Threshold Current	I_{th}			20	40	mA
Operation Current	I_{op}	$P_f = 20$ mW		120	167	mA
Optical Output Power from Fiber	P_f	$I_F = 167$ mA, $T_{LD} = T_{set}$	20			mW
Peak Emission Wavelength	λ_p	$P_f = 20$ mW, CW, $T_{LD} = T_{set}$	1 530	ITU-T ^{*1}	1 609	nm
Wavelength Stability	—	$T_{LD} = T_{set}$, applicable to wavelength monitor, E.O.L	-20		+20	pm
Spectral Line Width	$\Delta\nu$	$P_f = 20$ mW, CW, 3 dB down		1	2	MHz
Side Mode Suppression Ratio	SMSR	$P_f = 20$ mW, CW	35	45		dB
Relative Intensity Noise	RIN	$P_f = 20$ mW, 20 MHz to 3 GHz			-150	dB/Hz
Isolation	I_s		30			dB
Polarization Extinction Ratio ^{*2}	ext	$P_f = 20$ mW, CW	20			dB

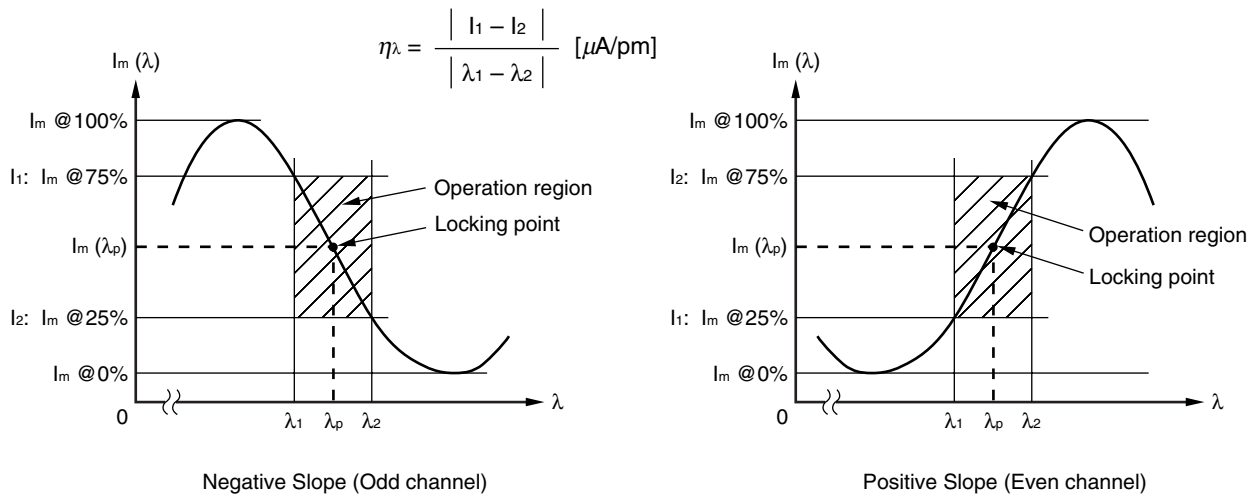
*1 Available for DWDM wavelengths based on ITU-T recommendations (50 GHz grid, please refer to the **ORDERING INFORMATION**)

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

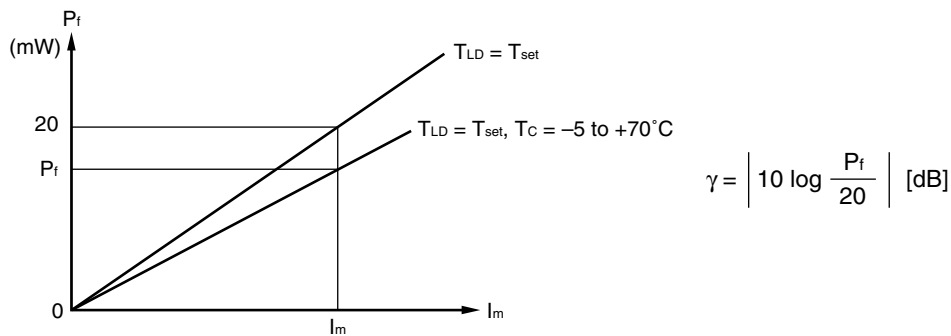
ELECTRO-OPTICAL CHARACTERISTICS (Applicable to Monitor PD: T_{LD} = T_{set}, T_c = -5 to +70°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Monitor Current (P _r Monitor)	I _m (P _r)	P _r = 20 mW, V _R = 5 V	30		300	μA
Monitor Current (λ _p Monitor)	I _m (λ _p)	P _r = 20 mW, V _R = 5 V, Locking point	15		150	μA
Operation Region ^{*1}	I _m (λ)		25		75	%
	λ ₁ -λ ₂		90			pm
Discrimination Slope ^{*1}	η _λ		0.05			μA/pm
Dark Current	I _D	V _R = 5 V		2	10	nA
Tracking Error	γ ^{*2}	I _m = const.			0.5	dB

*1 Operation region, Discrimination slope, Slope assignment



*2 Tracking Error: γ



ELECTRO-OPTICAL CHARACTERISTICS (Applicable to Thermistor and TEC: T_{LD} = T_{set}, 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	kΩ
B Constant	B	T _{LD} = 25°C	3 350	3 450	3 550	K
Cooler Current	I _c	ΔT = 70 - T _{set} , P _r = 20 mW			1.5	A
Cooler Voltage	V _c	ΔT = 70 - T _{set} , P _r = 20 mW			3.0	V

ORDERING INFORMATION

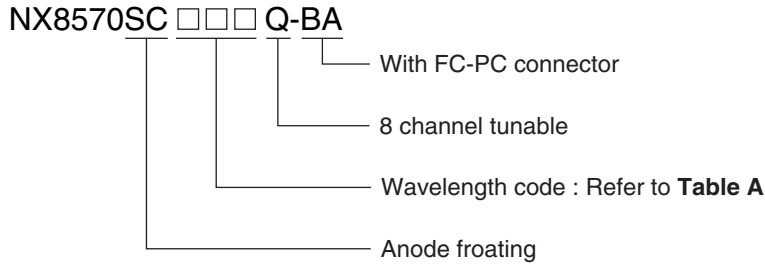


Table A: DWDM wavelength base on ITU-T recommendations (@ T_{LD} = T_{set}) (1/7)

Wavelength Code	ITU-T Wavelength *1 (nm)	Frequency (THz)	Monitor Slope
330Q	1 530.33	195.90	Negative
	1 530.72	195.85	Positive
	1 531.11	195.80	Negative
	1 531.50	195.75	Positive
	1 531.89	195.70	Negative
	1 532.29	195.65	Positive
	1 532.68	195.60	Negative
	1 533.07	195.55	Positive
362Q	1 533.46	195.50	Negative
	1 533.85	195.45	Positive
	1 534.25	195.40	Negative
	1 534.64	195.35	Positive
	1 535.03	195.30	Negative
	1 535.42	195.25	Positive
	1 535.82	195.20	Negative
	1 536.21	195.15	Positive
393Q	1 536.60	195.10	Negative
	1 537.00	195.05	Positive
	1 537.39	195.00	Negative
	1 537.79	194.95	Positive
	1 538.18	194.90	Negative
	1 538.58	194.85	Positive
	1 538.97	194.80	Negative
	1 539.37	194.75	Positive

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

Table A: DWDM wavelength base on ITU-T recommendations (@ T_{LD} = T_{set}) (2/7)

Wavelength Code	ITU-T Wavelength *1	Frequency	Monitor Slope
8 channel tunable	(nm)	(THz)	
425Q	1 539.76	194.70	Negative
	1 540.16	194.65	Positive
	1 540.55	194.60	Negative
	1 540.95	194.55	Positive
	1 541.34	194.50	Negative
	1 541.74	194.45	Positive
	1 542.14	194.40	Negative
	1 542.53	194.35	Positive
457Q	1 542.93	194.30	Negative
	1 543.33	194.25	Positive
	1 543.73	194.20	Negative
	1 544.12	194.15	Positive
	1 544.52	194.10	Negative
	1 544.92	194.05	Positive
	1 545.32	194.00	Negative
	1 545.72	193.95	Positive
489Q	1 546.11	193.90	Negative
	1 546.51	193.85	Positive
	1 546.91	193.80	Negative
	1 547.31	193.75	Positive
	1 547.71	193.70	Negative
	1 548.11	193.65	Positive
	1 548.51	193.60	Negative
	1 548.91	193.55	Positive
521Q	1 549.31	193.50	Negative
	1 549.71	193.45	Positive
	1 550.11	193.40	Negative
	1 550.51	193.35	Positive
	1 550.91	193.30	Negative
	1 551.31	193.25	Positive
	1 551.72	193.20	Negative
	1 552.12	193.15	Positive

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

Table A: DWDM wavelength base on ITU-T recommendations (@ T_{LD} = T_{set}) (3/7)

Wavelength Code	ITU-T Wavelength *1	Frequency	Monitor Slope
8 channel tunable	(nm)	(THz)	
553Q	1 552.52	193.10	Negative
	1 552.92	193.05	Positive
	1 553.32	193.00	Negative
	1 553.73	192.95	Positive
	1 554.13	192.90	Negative
	1 554.53	192.85	Positive
	1 554.94	192.80	Negative
	1 555.34	192.75	Positive
585Q	1 555.74	192.70	Negative
	1 556.15	192.65	Positive
	1 556.55	192.60	Negative
	1 556.95	192.55	Positive
	1 557.36	192.50	Negative
	1 557.76	192.45	Positive
	1 558.17	192.40	Negative
	1 558.57	192.35	Positive
618Q	1 558.98	192.30	Negative
	1 559.38	192.25	Positive
	1 559.79	192.20	Negative
	1 560.20	192.15	Positive
	1 560.60	192.10	Negative
	1 561.01	192.05	Positive
	1 561.41	192.00	Negative
	1 561.82	191.95	Positive
650Q	1 562.23	191.90	Negative
	1 562.64	191.85	Positive
	1 563.04	191.80	Negative
	1 563.45	191.75	Positive
	1 563.86	191.70	Negative
	1 564.27	191.65	Positive
	1 564.67	191.60	Negative
	1 565.08	191.55	Positive

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

Table A: DWDM wavelength base on ITU-T recommendations (@ T_{LD} = T_{set}) (4/7)

Wavelength Code	ITU-T Wavelength *1	Frequency	Monitor Slope
8 channel tunable	(nm)	(THz)	
683Q	1 565.49	191.50	Negative
	1 565.90	191.45	Positive
	1 566.31	191.40	Negative
	1 566.72	191.35	Positive
	1 567.13	191.30	Negative
	1 567.54	191.25	Positive
	1 567.95	191.20	Negative
	1 568.36	191.15	Positive
716Q	1 568.77	191.10	Negative
	1 569.18	191.05	Positive
	1 569.59	191.00	Negative
	1 570.00	190.95	Positive
	1 570.41	190.90	Negative
	1 570.82	190.85	Positive
	1 571.23	190.80	Negative
	1 571.65	190.75	Positive
749Q	1 572.06	190.70	Negative
	1 572.47	190.65	Positive
	1 572.88	190.60	Negative
	1 573.30	190.55	Positive
	1 573.71	190.50	Negative
	1 574.12	190.45	Positive
	1 574.54	190.40	Negative
	1 574.95	190.35	Positive
782Q	1 575.36	190.30	Negative
	1 575.78	190.25	Positive
	1 576.19	190.20	Negative
	1 576.61	190.15	Positive
	1 577.02	190.10	Negative
	1 577.44	190.05	Positive
	1 577.85	190.00	Negative
	1 578.27	189.95	Positive

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

Table A: DWDM wavelength base on ITU-T recommendations (@ T_{LD} = T_{set}) (5/7)

Wavelength Code	ITU-T Wavelength *1	Frequency	Monitor Slope
8 channel tunable	(nm)	(THz)	
816Q	1 578.68	189.90	Negative
	1 579.10	189.85	Positive
	1 579.51	189.80	Negative
	1 579.93	189.75	Positive
	1 580.35	189.70	Negative
	1 580.76	189.65	Positive
	1 581.18	189.60	Negative
	1 581.60	189.55	Positive
849Q	1 582.01	189.50	Negative
	1 582.43	189.45	Positive
	1 582.85	189.40	Negative
	1 583.27	189.35	Positive
	1 583.69	189.30	Negative
	1 584.10	189.25	Positive
	1 584.52	189.20	Negative
	1 584.94	189.15	Positive
883Q	1 585.36	189.10	Negative
	1 585.78	189.05	Positive
	1 586.20	189.00	Negative
	1 586.62	188.95	Positive
	1 587.04	188.90	Negative
	1 587.46	188.85	Positive
	1 587.88	188.80	Negative
	1 588.30	188.75	Positive
916Q	1 588.72	188.70	Negative
	1 589.14	188.65	Positive
	1 589.56	188.60	Negative
	1 589.98	188.55	Positive
	1 590.41	188.50	Negative
	1 590.83	188.45	Positive
	1 591.25	188.40	Negative
	1 591.67	188.35	Positive

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

Table A: DWDM wavelength base on ITU-T recommendations (@ T_{LD} = T_{set}) (6/7)

Wavelength Code	ITU-T Wavelength *1	Frequency	Monitor Slope
8 channel tunable	(nm)	(THz)	
950Q	1 592.10	188.30	Negative
	1 592.52	188.25	Positive
	1 592.94	188.20	Negative
	1 593.36	188.15	Positive
	1 593.79	188.10	Negative
	1 594.21	188.05	Positive
	1 594.64	188.00	Negative
	1 595.06	187.95	Positive
984Q	1 595.48	187.90	Negative
	1 595.91	187.85	Positive
	1 596.33	187.80	Negative
	1 596.76	187.75	Positive
	1 597.18	187.70	Negative
	1 597.61	187.65	Positive
	1 598.04	187.60	Negative
	1 598.46	187.55	Positive
6018Q	1 598.89	187.50	Negative
	1 599.32	187.45	Positive
	1 599.74	187.40	Negative
	1 600.17	187.35	Positive
	1 600.60	187.30	Negative
	1 601.02	187.25	Positive
	1 601.45	187.20	Negative
	1 601.88	187.15	Positive
6053Q	1 602.31	187.10	Negative
	1 602.74	187.05	Positive
	1 603.16	187.00	Negative
	1 603.59	186.95	Positive
	1 604.02	186.90	Negative
	1 604.45	186.85	Positive
	1 604.88	186.80	Negative
	1 605.31	186.75	Positive

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

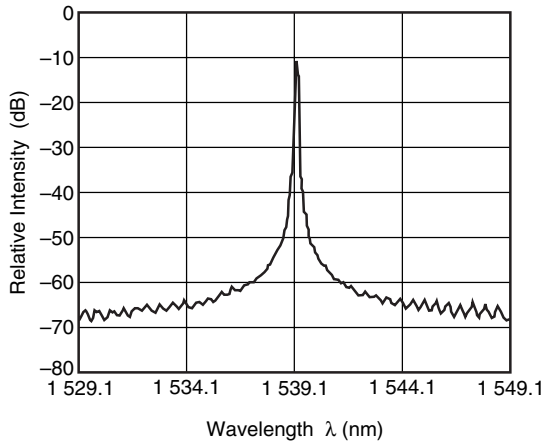
Table A: DWDM wavelength base on ITU-T recommendations (@ T_{LD} = T_{set}) (7/7)

Wavelength Code	ITU-T Wavelength *1 (nm)	Frequency (THz)	Monitor Slope
8 channel tunable			
6087Q	1 605.74	186.70	Negative
	1 606.17	186.65	Positive
	1 606.60	186.60	Negative
	1 607.03	186.55	Positive
	1 607.46	186.50	Negative
	1 607.89	186.45	Positive
	1 608.32	186.40	Negative
	1 608.76	186.35	Positive

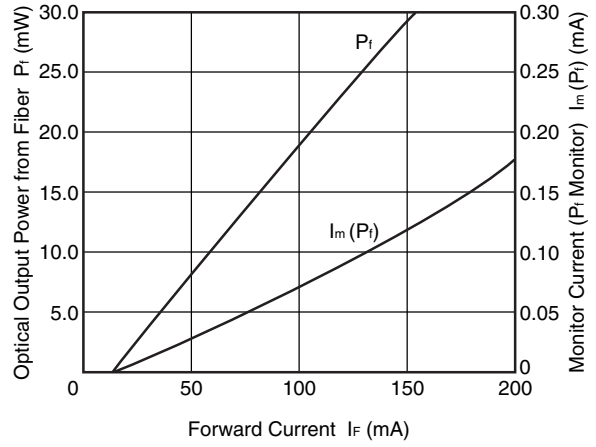
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TYPICAL CHARACTERISTICS ($T_{LD} = T_{set}$, unless otherwise specified)

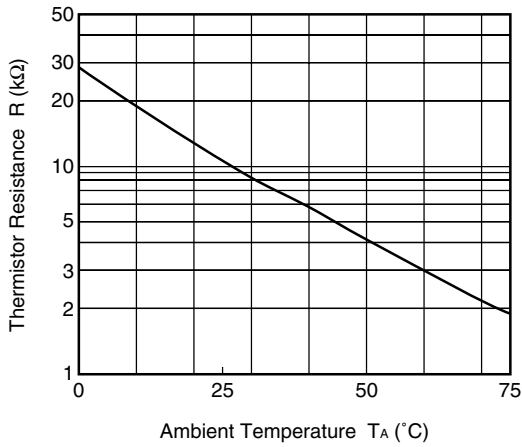
SPECTRUM



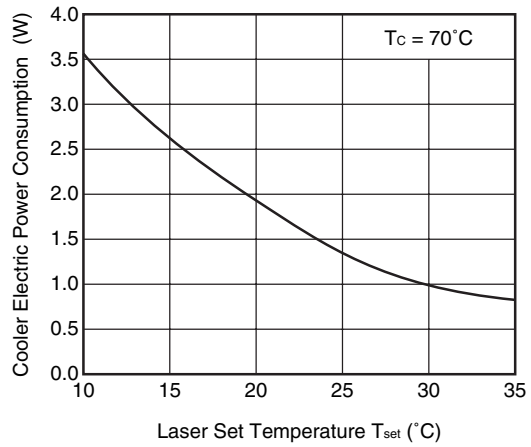
OPTICAL OUTPUT POWER FROM FIBER, MONITOR CURRENT (P_f MONITOR) vs. FORWARD CURRENT



THERMISTOR RESISTANCE vs. AMBIENT TEMPERATURE



COOLER ELECTRIC POWER CONSUMPTION vs. LASER SET TEMPERATURE



Remark The graphs indicate nominal characteristics.

REFERENCE

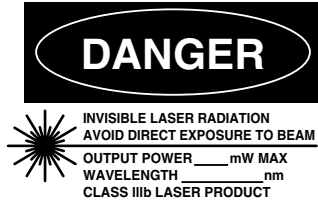
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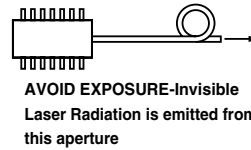
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- (Note)
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 - (2) "NEC semiconductor products" means any semiconductor product developed or manufactured by or for NEC (as defined above).

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

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