To our customers,

Old Company Name in Catalogs and Other Documents

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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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RENESAS

DATA SHEET

Phase-out/Discontinued

LASER DIODE

NX8530NH,NX8531NH

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

DESCRIPTION

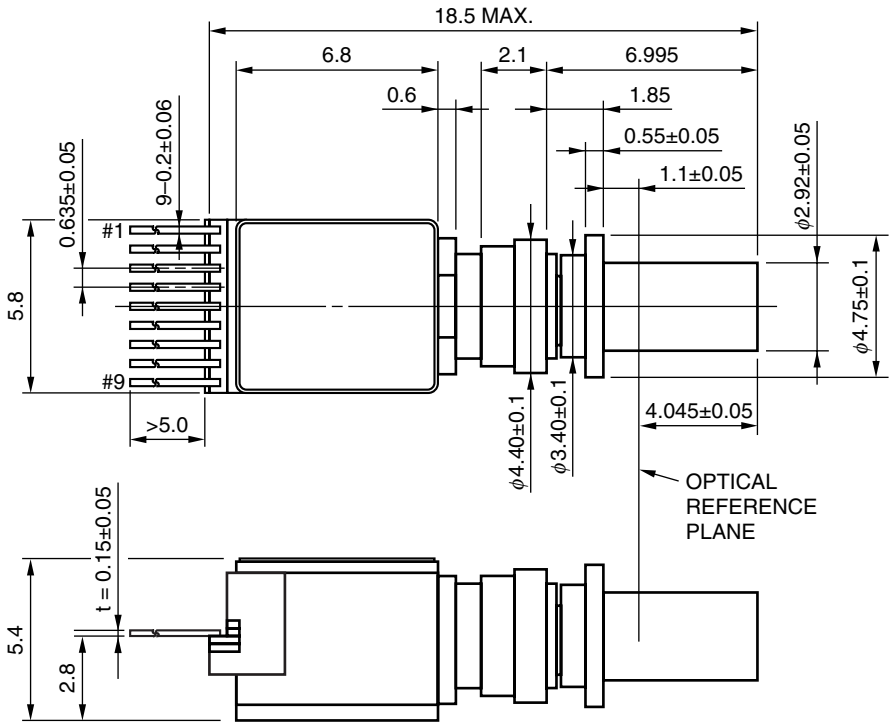
The NX8530NH and NX8531NH are 1 550 nm Multiple Quantum Wells (MQW) structured Distributed Feed-Back (DFB) laser diode module TOSA integrated a mini-TEC, with InGaAs monitor PIN-PD in a ceramic package designed for SFP transceivers and other types of modules with LC receptacle.

FEATURES

- Optical output power P_{AVG} = 0 dBm MIN. (NX8530NH)
  P_{AVG} = 4 dBm MIN. (NX8531NH)
- Available for DWDM C-band and L-band wavelengths based on ITU-T recommendations
  (100 GHz grid, please refer to the **ORDERING INFORMATION**)
- Built-in mini thermo-electric cooler with low power consumption
- Miniature 18.5 mm package with LC receptacle

Document No. PL10716EJ01V0DS (1st edition)
Date Published June 2008 NS
Printed in Japan

PACKAGE DIMENSIONS (UNIT: mm)



PIN CONNECTIONS

Pin No.	Function
1	Thermistor
2	Thermistor
3	LD Bias, LD Cathode
4	PD Anode
5	RF GND, LD Anode, PD Cathode
6	DATA, LD Cathode
7	RF GND, LD Anode, PD Cathode
8	TEC (+)
9	TEC (–)

ORDERING INFORMATION

NX8530NH□□□
NX8531NH□□□

Wavelength Code : Refer to **Table A**

Table A: DWDM wavelength based on ITU-T recommendations (@T_{LD} = T_{set}) (1/2)

Wavelength Code	ITU-T Wavelength*1 (nm)	Frequency (THz)	Wavelength Code	ITU-T Wavelength*1 (nm)	Frequency (THz)
279	1 527.99	196.20	485	1 548.51	193.60
287	1 528.77	196.10	493	1 549.32	193.50
295	1 529.55	196.00	501	1 550.12	193.40
303	1 530.33	195.90	509	1 550.92	193.30
311	1 531.12	195.80	517	1 551.72	193.20
318	1 531.90	195.70	525	1 552.52	193.10
326	1 532.68	195.60	533	1 553.33	193.00
334	1 533.47	195.50	541	1 554.13	192.90
342	1 534.25	195.40	549	1 554.94	192.80
350	1 535.04	195.30	557	1 555.75	192.70
358	1 535.82	195.20	565	1 556.55	192.60
366	1 536.61	195.10	573	1 557.36	192.50
373	1 537.40	195.00	581	1 558.17	192.40
381	1 538.19	194.90	589	1 558.98	192.30
389	1 538.98	194.80	597	1 559.79	192.20
397	1 539.77	194.70	606	1 560.61	192.10
405	1 540.56	194.60	614	1 561.42	192.00
413	1 541.35	194.50	622	1 562.23	191.90
421	1 542.14	194.40	630	1 563.05	191.80
429	1 542.94	194.30	638	1 563.86	191.70
437	1 543.73	194.20	646	1 564.68	191.60
445	1 544.53	194.10	654	1 565.50	191.50
453	1 545.32	194.00	663	1 566.31	191.40
461	1 546.12	193.90	671	1 567.13	191.30
469	1 546.92	193.80	679	1 567.95	191.20
477	1 547.72	193.70	687	1 568.77	191.10

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

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

Wavelength Code	ITU-T Wavelength*1 (nm)	Frequency (THz)	Wavelength Code	ITU-T Wavelength*1 (nm)	Frequency (THz)
695	1 569.59	191.00	904	1 590.41	188.50
704	1 570.42	190.90	912	1 591.26	188.40
712	1 571.24	190.80	921	1 592.10	188.30
720	1 572.06	190.70	929	1 592.95	188.20
728	1 572.89	190.60	937	1 593.79	188.10
737	1 573.71	190.50	946	1 594.64	188.00
745	1 574.54	190.40	954	1 595.49	187.90
753	1 575.37	190.30	963	1 596.34	187.80
761	1 576.20	190.20	971	1 597.19	187.70
770	1 577.03	190.10	980	1 598.04	187.60
778	1 577.86	190.00	988	1 598.89	187.50
786	1 578.69	189.90	997	1 599.75	187.40
795	1 579.52	189.80	6006	1 600.60	187.30
803	1 580.35	189.70	6014	1 601.46	187.20
811	1 581.18	189.60	6023	1 602.31	187.10
820	1 582.02	189.50	6031	1 603.17	187.00
828	1 582.85	189.40	6040	1 604.03	186.90
836	1 583.69	189.30	6048	1 604.88	186.80
845	1 584.53	189.20	6057	1 605.74	186.70
853	1 585.36	189.10	6066	1 606.60	186.60
862	1 586.20	189.00	6074	1 607.47	186.50
870	1 587.04	188.90	6083	1 608.33	186.40
878	1 587.88	188.80	6091	1 609.19	186.30
887	1 588.73	188.70	6100	1 610.06	186.20
895	1 589.57	188.60			

***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_{FLD}	300	mA
Reverse Voltage of LD	V_{RLD}	2.0	V
Forward Current of PD	I_{FPD}	2.0	mA
Reverse Voltage of PD	V_{RPD}	20	V
Operating Case Temperature	T_C	−5 to +75	°C
Storage Temperature	T_{stg}	−40 to +85	°C
Lead Soldering Temperature	T_{sld}	350 (3 sec.)	°C
Cooler Current	I_C	0.9	A
Cooler Voltage	V_C	1.8	V

ELECTRO-OPTICAL CHARACTERISTICS ($T_{LD} = T_{set}$, T_C = –5 to +75°C, BOL)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Laser Set Temperature	T_{set}		35		50	°C
Operating Voltage	V_{op}		0.9		2.0	V
Threshold Current	I_{th}		5	20	40	mA
Optical Output Power (average)	P_{AVG}	$I_F = I_{op}$, $T_{LD} = T_{set}$ (NX8530NH)	0		4	dBm
		$I_F = I_{op}$, $T_{LD} = T_{set}$ (NX8531NH)	4		7	
Operating Current	I_{op}				100	mA
Threshold Output Power	P_{th}	$I_F = I_{th}$			100	μW
Slope Efficiency	η	CW (NX8530NH)	0.04	0.1		W/A
		CW (NX8531NH)	0.08	0.18		
Peak Emission Wavelength	λ_p	P_f = 10 mW, CW, $T_{LD} = T_{set}$	1 528	ITU-T[*1]	1 563	nm
			1 564		1 610	
Side Mode Suppression Ratio	SMSR	CW, $I_F = I_{op}$	30	35		dB
Relative Intensity Noise	RIN	CW, $I_F = I_{op}$, f = 20 MHz to 3 GHz			–140	dB/Hz
Rise Time	t_r	20-80%, T_C = 25°C			120	ps
Fall Time	t_f	80-20%, T_C = 25°C			120	ps
Electrical Input Return Loss	S_{11}	f = 50 MHz to 3 GHz	6			dB
		f = 3 GHz to 5 GHz	3			
Band Width	BW	–3 dB, $I_F = I_{op}$	2.5			GHz
Dispersion Penalty	DP	T_C = 25°C[*2]			2.0	dB

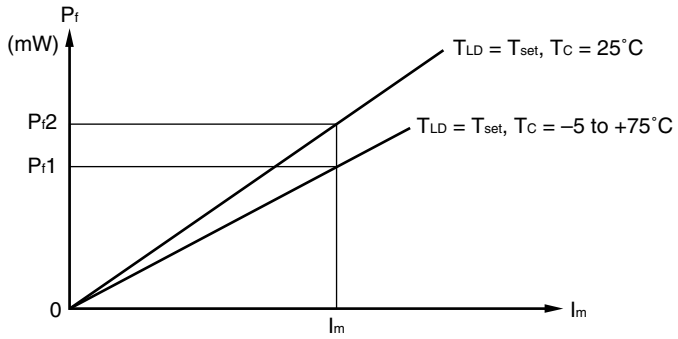
***1** Available for DWDM wavelengths based on ITU-T recommendations
(100 GHz grid, please refer to the **ORDERING INFORMATION**)

***2** 2.48832 Gb/s, PRBS 2^{23}–1, NRZ, Extinction Ratio $\geq$ 9.0 dB, 2 400 ps/nm

ELECTRO-OPTICAL CHARACTERISTICS
(Applicable to Monitor PD: $T_{LD} = T_{set}$, T_C = –5 to +75°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Monitor Current	I_m	P_f = 5 mW (NX8530NH)	0.08		2.0	mA
		P_f = 10 mW (NX8531NH)				
Dark Current	I_D	V_R = 5 V			100	nA
Tracking Error	γ *1	I_m = const.	–1.0		1.0	dB

*1 $\gamma = \left| 10 \log \frac{P_f1}{P_f2} \right|$



ELECTRO-OPTICAL CHARACTERISTICS
(Applicable to Thermistor and TEC: $T_{LD} = T_{set}$, T_C = –5 to +75°C, BOL)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Thermistor Resistance	R	T_{LD} = 25°C	9.5	10.0	10.5	kΩ
B Constant	B		3 350	3 450	3 550	K
Cooler Current	I_C	ΔT = 40°C (NX8530NH)			0.4	A
		ΔT = 40°C (NX8531NH)			0.5	
Cooler Voltage	V_C	ΔT = 40°C (NX8530NH)			1.0	V
		ΔT = 40°C (NX8531NH)			1.5	

REFERENCE

Document Name	Document No.
Opto-Electronics Devices Pamphlet	PX10160E

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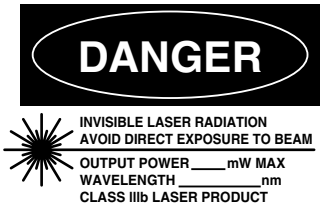

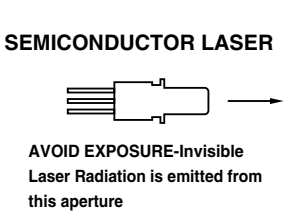

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