

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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RECEIVER
NDL5422P

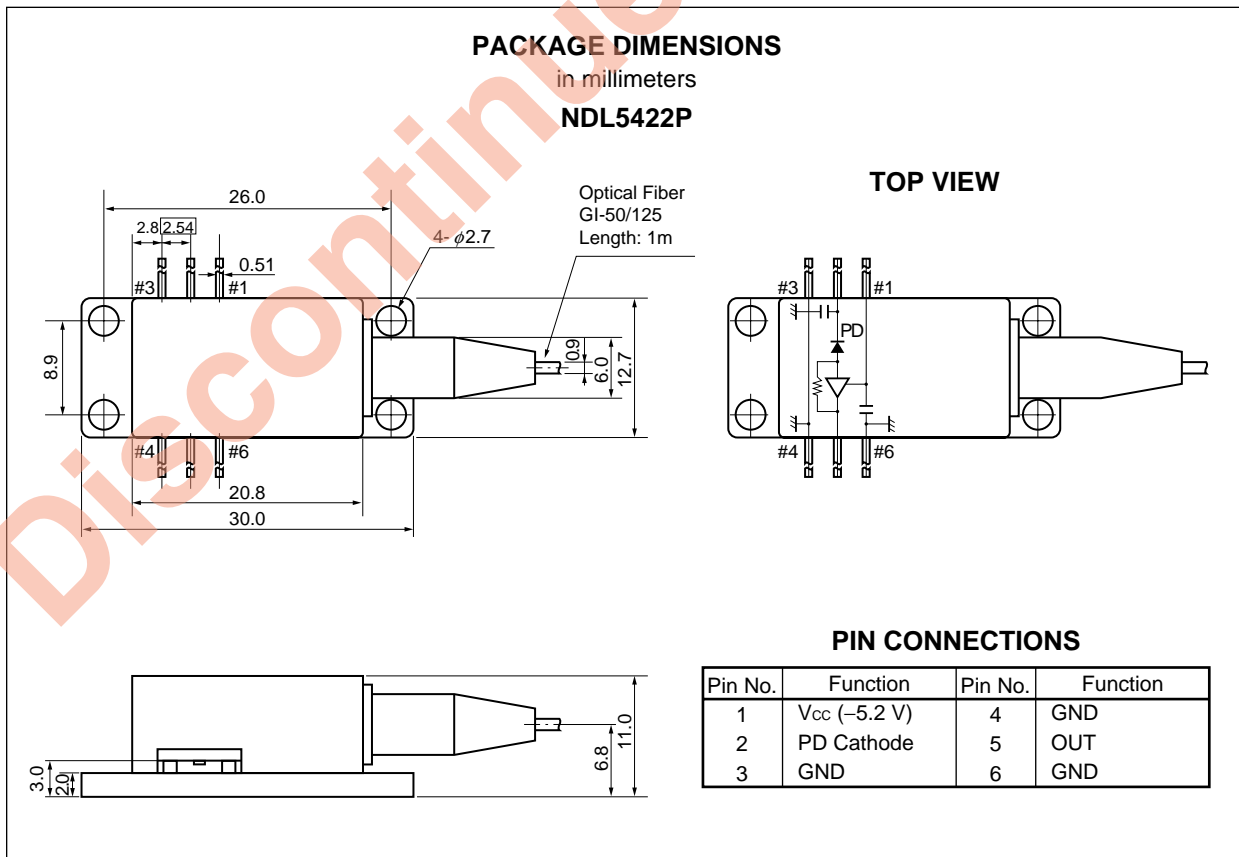
**φ50 μm InGaAs PIN PHOTO DIODE BUTTERFLY MODULE
WITH INTERNAL PRE-AMPLIFIER FOR 2.5 Gb/s**

DESCRIPTION

NDL5422P is an InGaAs PIN photo diode 6-pin butterfly package module incorporating silicon pre-amplifier IC. It is especially designed as an optical receiver for 2.5 Gb/s fiber optic communications systems. YAG laser welding technique is utilized to achieve stable optical coupling over wide operating temperature range (-40 to +70 °C).

FEATURES

- Internal Si pre-amplifier IC
- High sensitivity $\bar{P} = -23$ dBm TYP. @ 2.5 Gb/s, NRZ
- High speed $f_c = 4$ GHz
- Output impedance 50Ω
- Transimpedance 300Ω
- Detecting area size $\phi 50 \mu\text{m}$
- Multimode fiber pigtail
- Hermetically sealed 6-pin butterfly package



The information in this document is subject to change without notice.

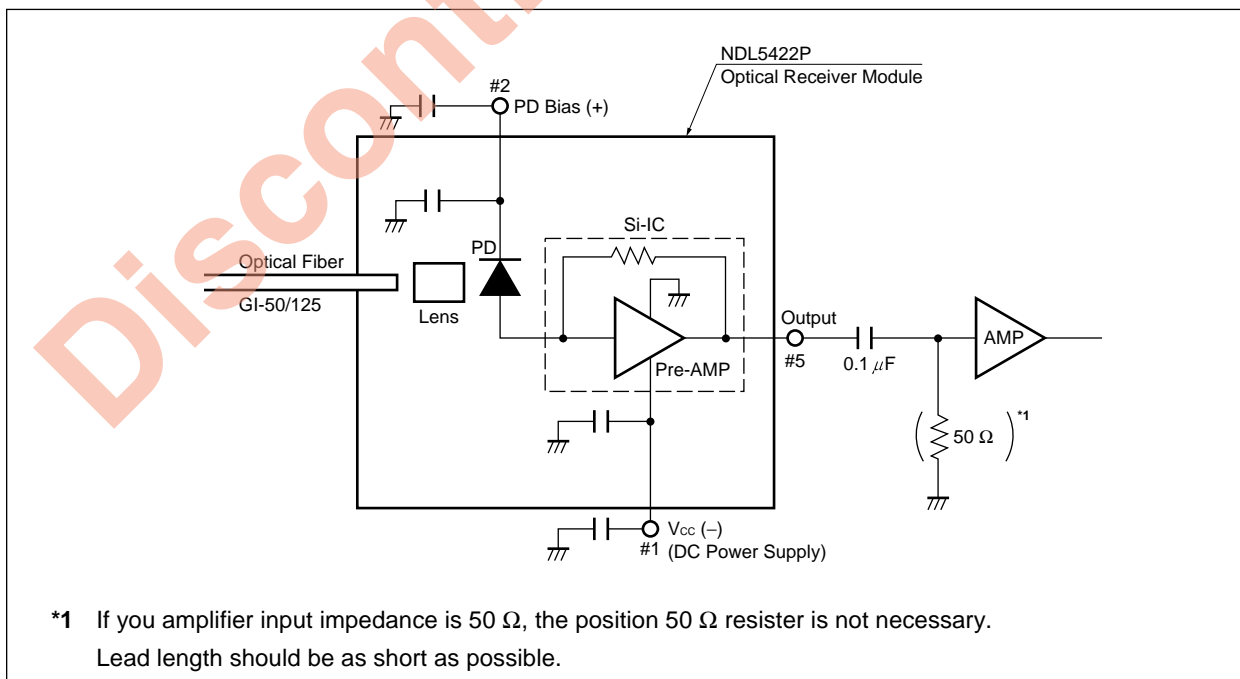
ABSOLUTE MAXIMUM RATINGS (T_c = 25 °C, unless otherwise specified)

Parameter	Symbol	Ratings	Unit
Reverse Current	I _R	0.5	mA
Supply Voltage	V _{cc}	-6.0	V
Operating Case Temperature	T _c	-40 to +70	°C
Storage Temperature	T _{stg}	-40 to +85	°C
Lead Soldering Temperature (10 s)	T _{slid}	260	°C

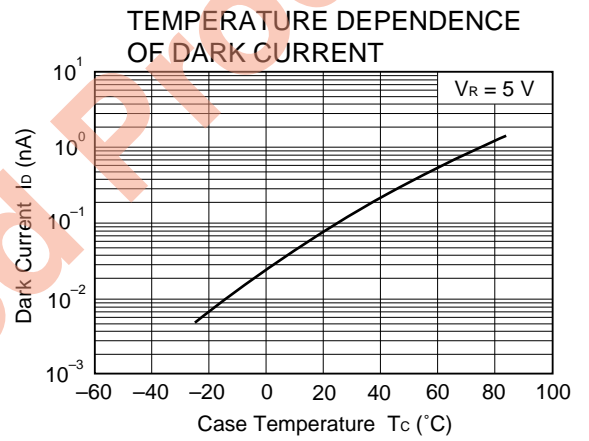
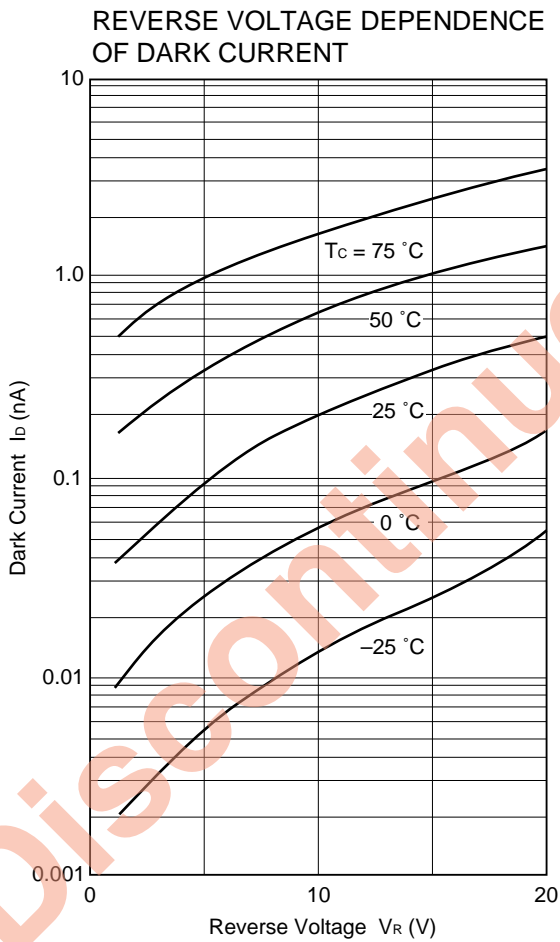
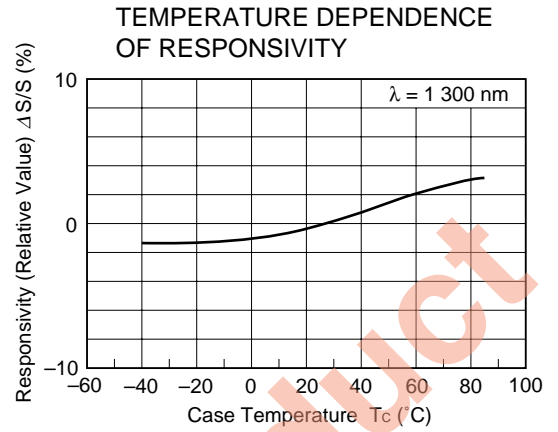
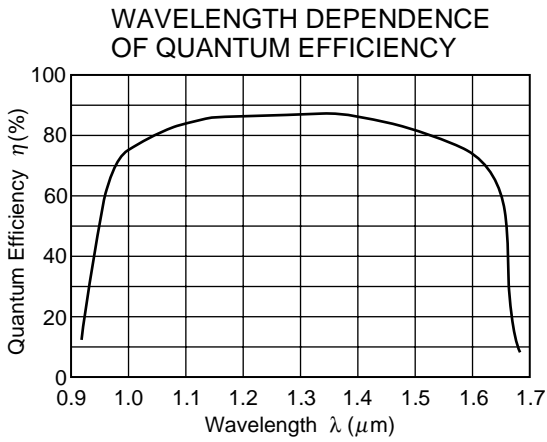
ELECTRO-OPTICAL CHARACTERISTICS (T_c = 25 °C)

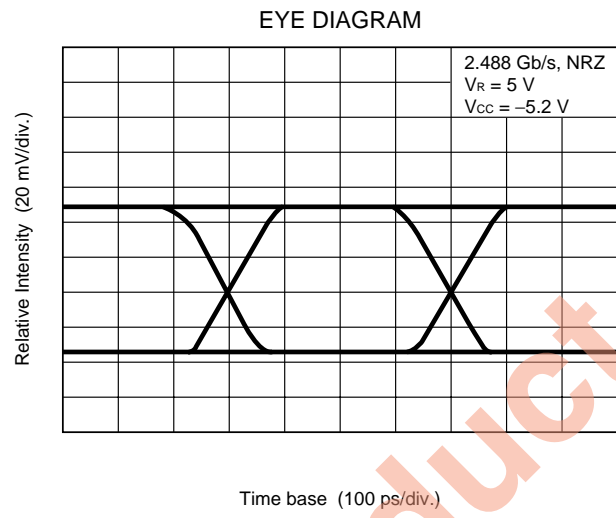
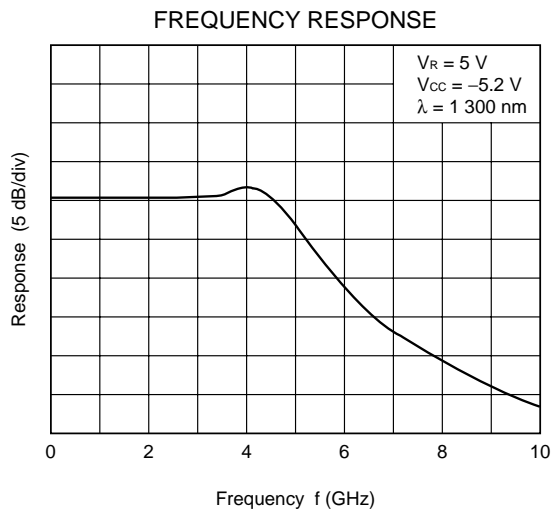
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Dark Current	I _D	V _R = 5 V		0.1	5.0	nA
Receiver Sensitivity	\bar{P}	2.488 Gb/s, NRZ, PN 2 ¹⁵ - 1		-23	-20	dBm
Dynamic range	D _r	BER = 10 ⁻¹¹ , Mark: 1/2, λ = 1 310 nm		20		dB
Quantum Efficiency	η	λ = 1 310 nm	70	85		%
		λ = 1 550 nm		80		
Cut-off Frequency	f _c	-3 dB point	2.5	4.0		GHz
Equivalent Input Noise Current	I _n			9.0		pA/√Hz
Power Supply Voltage	V _{cc}			-5.2		V
Power Supply Current	I _{cc}	V _{cc} = -5.2 V		23	30	mA
Transimpedance	Z _t			300		Ω
Output Impedance	Z _{out}			50		Ω

RECOMMENDED EXTERNAL CIRCUIT



TYPICAL CHARACTERISTICS (T_c = 25 °C, unless otherwise specified)





Discontinued Product

InGaAs APD/PD FAMILY



Features Packages	APD				PIN-PD		Remarks
	$\phi 30 \mu\text{m}$ (for 2.5 Gb/s)	$\phi 50 \mu\text{m}$ (for 2.5 Gb/s)	$\phi 50 \mu\text{m}$	$\phi 80 \mu\text{m}$	$\phi 50 \mu\text{m}$ (for 2.5 Gb/s)	$\phi 80 \mu\text{m}$	
TO-18 type Can	NDL5530	_____	NDL5500	NDL5510	_____	_____	3 pins
TO-18 type Can with Micro Lens	_____	_____	_____	_____	NDL5490L ^{*3,4}	NDL5405L	3 pins
Small Can $\phi 5.6 \mu\text{m}$	NDL5531	_____	_____	_____	NDL5490 ^{*3,4}	_____	
Chip on Carrier	NDL5530C	NDL5520C	NDL5500C	NDL5510C	_____	_____	
Receptacle Module	_____	_____	_____	_____	_____	NDL5471RC NDL5471RD	3 pins RC: FC receptacle RD: SC receptacle
Coaxial Module with MMF	_____	NDL5521P NDL5521P1 NDL5521P2	NDL5551P NDL5551P1 NDL5551P2 NDL5553P ^{*1} NDL5553P1 ^{*1} NDL5553P2 ^{*1} NDL5590P NDL5590P1 NDL5590P2	NDL5561P ^{*2} NDL5561P1 ^{*2} NDL5561P2 ^{*2}	NDL5421P NDL5421P1 NDL5421P2	NDL5461P NDL5461P1 NDL5461P2	P1, P2: With flange NDL5590P Series: With Pre-AMP
Coaxial Module with SMF	NDL5531P NDL5531P1 NDL5531P2	_____	NDL5553PS ^{*1} NDL5553P1S ^{*1} NDL5553P2S ^{*1}	_____	_____	NDL5481P ^{*5} NDL5481P1 ^{*5} NDL5481P2 ^{*5}	
14-pin DIP Module with TEC	_____	_____	NDL5506P NDL5506PS	_____	_____	_____	$\Delta T = 45 \text{ K}$ (@ $I_c = 1.1 \text{ A}$) PS: With SMF
6-pin BFY Module with MMF	_____	NDL5522P	_____	_____	NDL5422P	_____	With Pre-AMP

- *1 For OTDR
- *2 With GI-62.5/125
- *3 Under development
- *4 Internal pre-amplifier for 1Gb/s
- *5 For analog application (optical CATV)

Remark Modules are available with FC-PC connector or optional SC-PC connector.

★ REFERENCE

Document Name	Document No.
NEC semiconductor device reliability/quality control system	LEI-1201
Quality grades on NEC semiconductor devices	IEI-1209
Semiconductor device mounting technology manual	C10535E
Guide to quality assurance for semiconductor devices	MEI-1202
Semiconductor selection guide	X10679E

Discontinued Product

[MEMO]

Discontinued Product

CAUTION

Within this device there exists GaAs (Gallium Arsenide) material which is a harmful substance if ingested. Please do not under any circumstances break the hermetic seal.

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NEC devices are classified into the following three quality grades:

"Standard", "Special", and "Specific". The Specific quality grade applies only to devices developed based on a customer designated "quality assurance program" for a specific application. The recommended applications of a device depend on its quality grade, as indicated below. Customers must check the quality grade of each device before using it in a particular application.

Standard: Computers, office equipment, communications equipment, test and measurement equipment, audio and visual equipment, home electronic appliances, machine tools, personal electronic equipment and industrial robots

Special: Transportation equipment (automobiles, trains, ships, etc.), traffic control systems, anti-disaster systems, anti-crime systems, safety equipment and medical equipment (not specifically designed for life support)

Specific: Aircrafts, aerospace equipment, submersible repeaters, nuclear reactor control systems, life support systems or medical equipment for life support, etc.

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Anti-radioactive design is not implemented in this product.