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

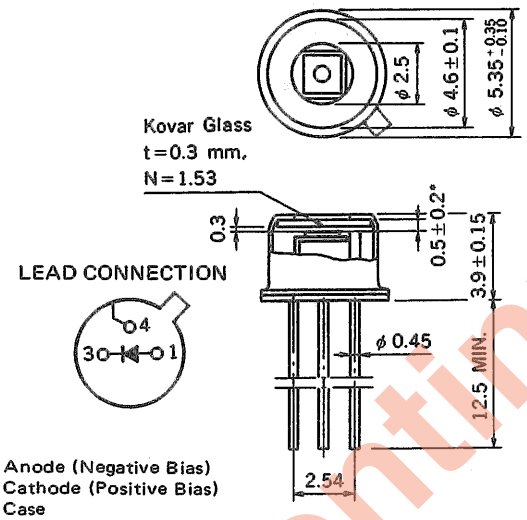
PHOTO DIODE
NDL5406

1 000 to 1 600 nm OPTICAL FIBER COMMUNICATIONS
270×330 μm InGaAs PIN PHOTO DIODE

DESCRIPTION

NDL5406 is a 270 μm x 330 μm InGaAs PIN photo diode for a light detector. It covers the wavelength range between 1 000 and 1 600 nm with high sensitivity.

PACKAGE DIMENSIONS
in millimeters



1. Anode (Negative Bias)
3. Cathode (Positive Bias)
4. Case

*Optical length

FEATURES

- High quantum efficiency. η = 85 % @1 300 nm
  η = 80 % @1 550 nm
- Small dark current. I_D = 0.5 nA
- Low operating voltage.
- Detecting area size. 270 μm x 330 μm

ABSOLUTE MAXIMUM RATINGS (T_a = 25 °C)

Reverse Voltage	V_R	20	V
Forward Current	I_F	10	mA
Reverse Current	I_R	5	mA
Operating Temperature	T_c	−40 to +85	°C
Storage Temperature	T_{stg}	−55 to +150	°C

ELECTRO-OPTICAL CHARACTERISTICS (T_a = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Dark Current	I_D		0.5	7.0	nA	V_R = 5 V
Terminal Capacitance	C_t		4.0	7.5	pF	V_R = 5 V, f = 1.0 MHz
Quantum Efficiency	η	70	85		%	λ = 1 300 nm
			80			λ = 1 550 nm
Sensitivity	S	0.73	0.89		A/W	λ = 1 300 nm
			1.00			λ = 1 550 nm
Rise, Fall Time	t_r, t_f		4		ns	V_R = 5 V, λ = 1 300 nm, R_L = 50 Ω, 10–90 %

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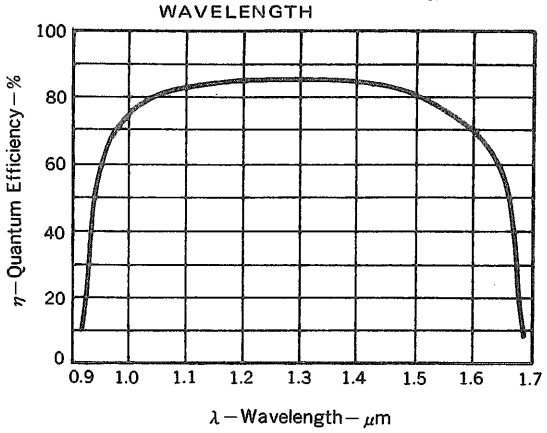
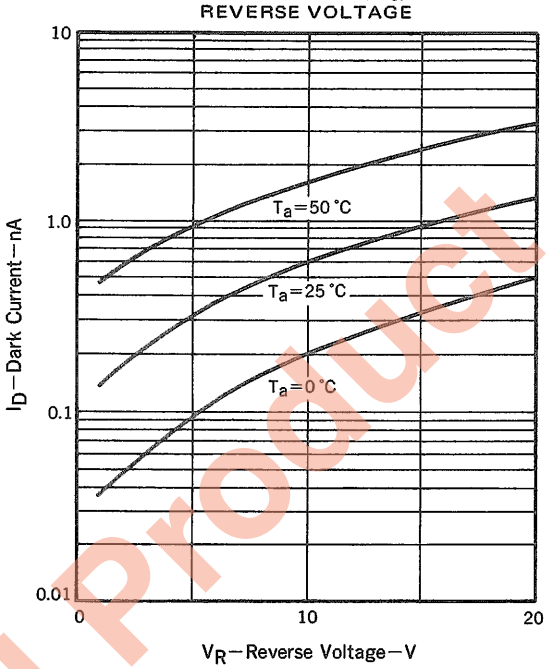
TYPICAL CHARACTERISTICS (T_a = 25 °C)

QUANTUM EFFICIENCY vs. WAVELENGTH



DARK CURRENT vs. REVERSE VOLTAGE



InGaAs APD/PD FAMILY

FEATURES / PACKAGES		APD		PIN-PD		REMARKS	
		ϕ 50 μm	ϕ 80 μm	ϕ 80 μm	270 μm x 330 μm		
TO-18 TYPE CAN		NDL5500	NDL5510	NDL5405	NDL5406	3 PIN	
TO-18 TYPE CAN WITH MICRO LENS		———	———	NDL5405L	———	3 PIN	
CHIP ON CARRIER		NDL5500C	NDL5510C	NDL5405C	NDL5406C		
COAXIAL MODULE WITH MULTI MODE FIBER (MMF)		NDL5500P*	———	NDL5405P*	———	3 PIN	
MAIN CHARACTERISTICS (T_a = 25 °C)						UNIT	CONDITIONS
BREAKDOWN VOLTAGE	$V_{(BR)R}$	70	75	———	———	V	I_D = 100 μA
QUANTUM EFFICIENCY	η	85	85	85	85	%	λ = 1 300 nm
		80	80	80	80		λ = 1 550 nm
DARK CURRENT	I_D	20	60	0.1	0.5	nA	V = V_{op}
RISE TIME	t_r	f_c = 1.0 GHz MIN.	f_c = 700 MHz MIN.	0.3	4.0	ns	10–90 %
FALL TIME	t_f			0.3	4.0	ns	90–10 %

* A module with flange is also available.

[MEMO]