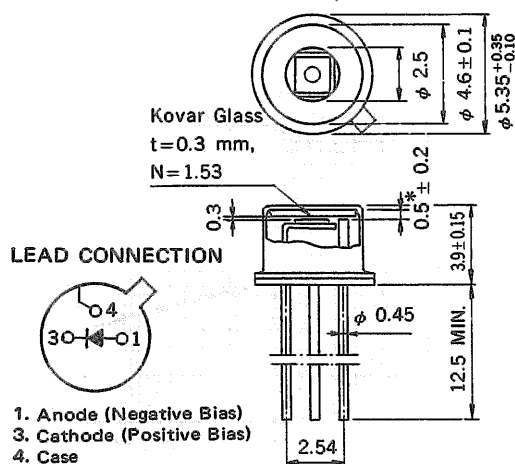


1 300 nm OPTICAL FIBER COMMUNICATIONS
φ 100 μm GERMANIUM AVALANCHE PHOTO DIODE

DESCRIPTION

NDL5100 is a Germanium Avalanche Photo diode especially designed for a detector of long wavelength fiber transmission systems. It features small dark current and high response speed.

PACKAGE DIMENSIONS
in millimeters



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

*Optical length

FEATURES

- Small dark current. $I_D = 0.2 \mu A$
- High sensitivity. $\eta = 75 \% @1300 \text{ nm}$
- Short optical length.
- Hermetically sealed package.
- Detecting area size. $\phi 100 \mu m$

ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ C$)

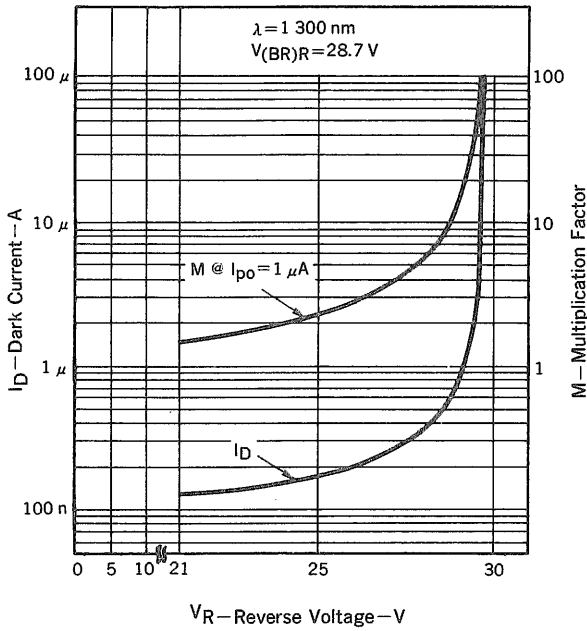
Forward Current	I_F	50	mA
Reverse Current	I_R	0.5	mA
Operating Case Temperature	T_C	-40 to +60	$^\circ C$
Storage Temperature	T_{stg}	-55 to +125	$^\circ C$

ELECTRO-OPTICAL CHARACTERISTICS ($T_a = 25^\circ C$)

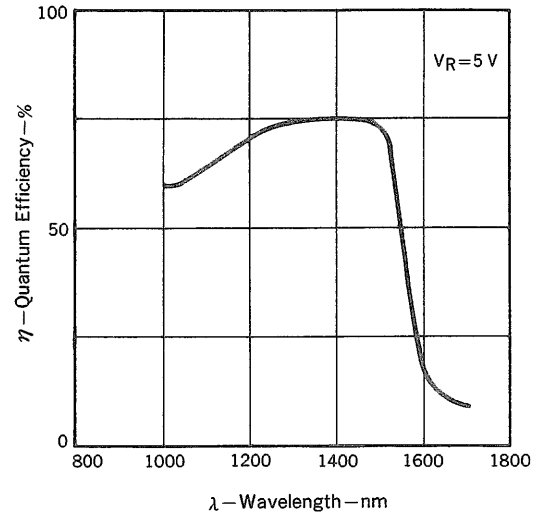
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Reverse Breakdown Voltage	$V_{(BR)R}$	25		48	V	$I_D = 100 \mu A$
Dark Current	I_D		0.2	0.5	μA	$V_R = V_{(BR)R} \times 0.9$
Terminal Capacitance	C_t		2.0	3.0	pF	$V_R = 20 \text{ V}, f = 1.0 \text{ MHz}$
Quantum Efficiency	η	70	75		%	$\lambda = 1300 \text{ nm}$
Sensitivity	S	0.73	0.78		A/W	$\lambda = 1300 \text{ nm}$
Multiplication Factor	M	20	40			$\lambda = 1300 \text{ nm}, R_L = 100 \Omega$ $I_{po} = 1.0 \mu A, V_R = V (I_D = 10 \mu A)$
Rise Time	t_r		0.5	0.8	ns	$\lambda = 1300 \text{ nm}, M = 10$ $R_L = 50 \Omega, I_{po} = 10 \mu A, 10-90 \%$
Fall Time	t_f		0.5	0.8	ns	$\lambda = 1300 \text{ nm}, M = 10$ $R_L = 50 \Omega, I_{po} = 10 \mu A, 90-10 \%$
Excess Noise Factor	x		0.95			$\lambda = 1300 \text{ nm}, M = 10, I_{po} = 1.0 \mu A$ $f = 30 \text{ MHz}, B = 1.0 \text{ MHz}$

TYPICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

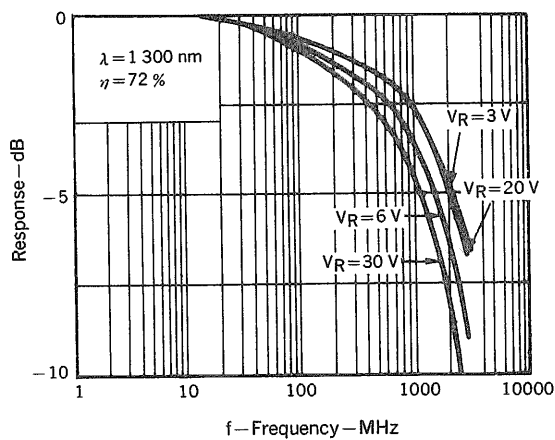
DARK CURRENT, MULTIPLICATION FACTOR vs. REVERSE VOLTAGE



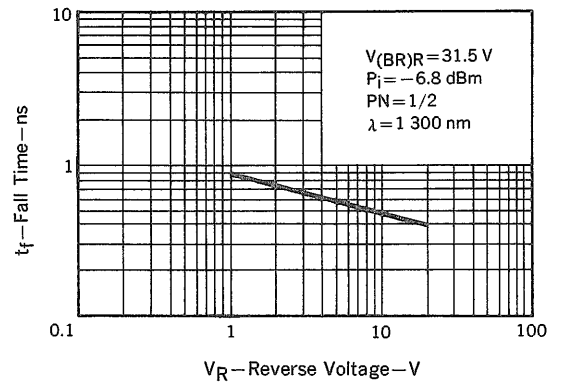
QUANTUM EFFICIENCY vs. WAVELENGTH



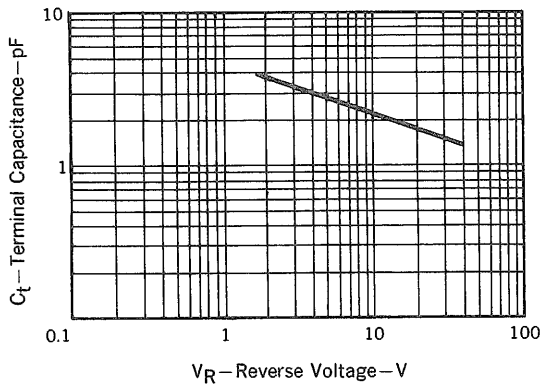
FREQUENCY RESPONSE



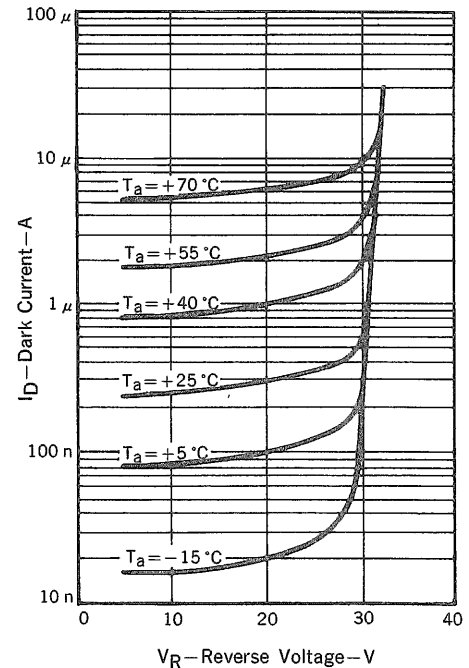
FALL TIME vs. REVERSE VOLTAGE



TERMINAL CAPACITANCE vs. REVERSE VOLTAGE



DARK CURRENT vs. REVERSE VOLTAGE



Ge APD/PD FAMILY

FEATURES		APD		PIN-PD	REMARKS	
		ϕ 100 μ m	ϕ 30 μ m	ϕ 240 μ m		
PACKAGES						
TO-18 TYPE CAN		NDL5100	NDL5102	NDL5200		
CHIP ON CARRIER		NDL5100C	NDL5102C	—————		
COAXIAL MODULE WITH MULTI MODE FIBER (MMF)		NDL5100P*	—————	—————		
COAXIAL MODULE WITH SINGLE MODE FIBER (SMF)		—————	NDL5102P*	—————		
MAIN CHARACTERISTICS ($T_a = 25^\circ\text{C}$)					UNIT	CONDITIONS
BREAKDOWN VOLTAGE	$V_{(BR)R}$	29	35	—————	V	$I_D = 100 \mu\text{A}$
QUANTUM EFFICIENCY	η	75	75	75	%	$\lambda = 1300 \text{ nm}$
DARK CURRENT	I_D	200	80	500	nA	$V = V_{op}$
RISE TIME	t_r	0.5	0.3	3	ns	10–90 %
FALL TIME	t_f	0.5	0.3	5	ns	90–10 %

* A module with flange is also available.

[MEMO]

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