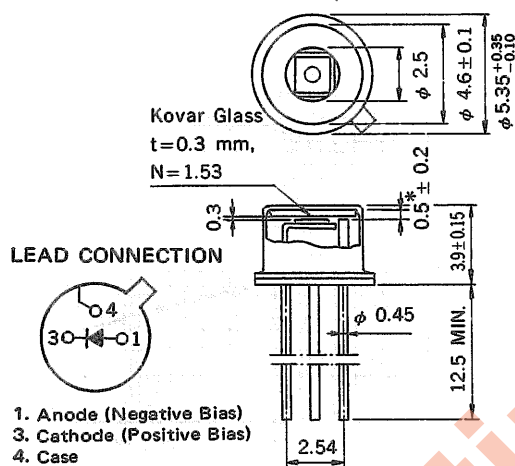


1 300 nm OPTICAL FIBER COMMUNICATIONS
φ 100 μm GERMANIUM AVALANCHE PHOTO DIODE

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



*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 ($T_a = 25^\circ C$)

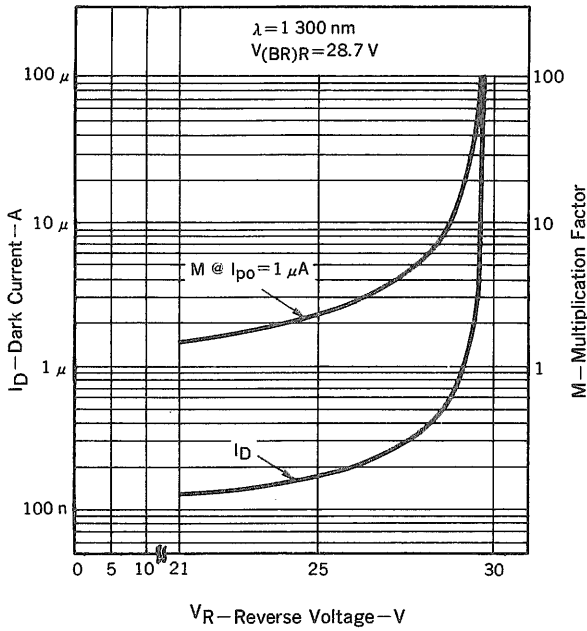
Forward Current	I_F	50	mA
Reverse Current	I_R	0.5	mA
Operating Case Temperature	T_C	-40 to +60	$^\circ C$
Storage Temperature	T_{stg}	-55 to +125	$^\circ C$

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

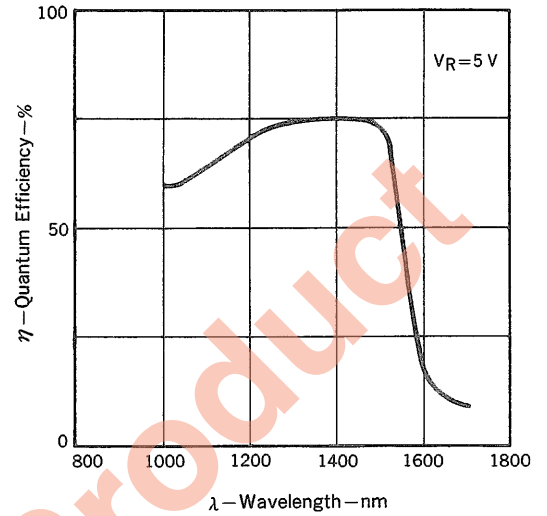
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Reverse Breakdown Voltage	$V_{(BR)R}$	25		48	V	$I_D = 100 \mu A$
Dark Current	I_D		0.2	0.5	μA	$V_R = V_{(BR)R} \times 0.9$
Terminal Capacitance	C_t		2.0	3.0	pF	$V_R = 20 \text{ V}, f = 1.0 \text{ MHz}$
Quantum Efficiency	η	70	75		%	$\lambda = 1300 \text{ nm}$
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 ($T_a = 25^\circ\text{C}$)

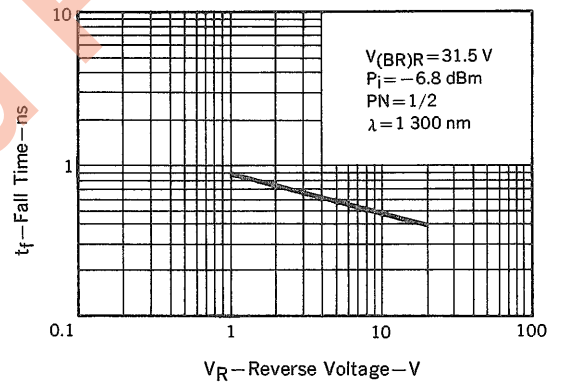
DARK CURRENT, MULTIPLICATION FACTOR vs. REVERSE VOLTAGE



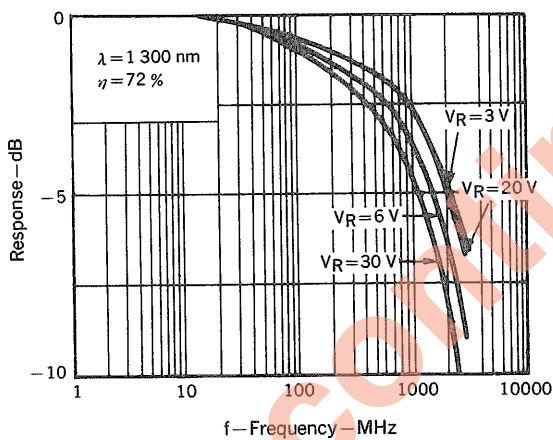
QUANTUM EFFICIENCY vs. WAVELENGTH



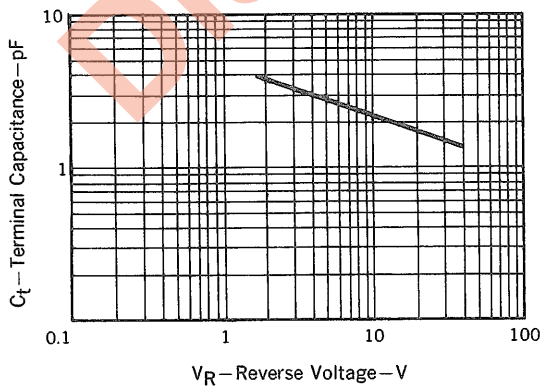
FALL TIME vs. REVERSE VOLTAGE



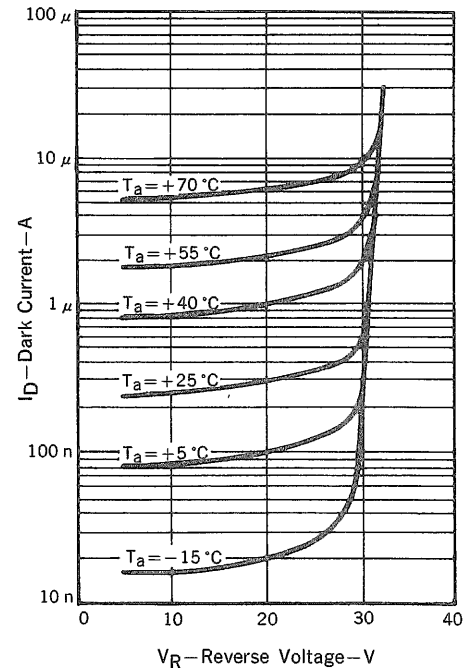
FREQUENCY RESPONSE



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.

Discontinued Product

[MEMO]

No part of this document may be copied or reproduced in any form or by any means without the prior written consent of NEC Corporation. NEC Corporation assumes no responsibility for any errors which may appear in this document.

NEC Corporation does not assume any liability for infringement of patents, copyrights or other intellectual property rights of third parties by or arising from use of a device described herein or any other liability arising from use of such device. No license, either express, implied or otherwise, is granted under any patents, copyrights or other intellectual property rights of NEC Corporation or of others.