CEL

PHOTO DIODE

NR8300FP-CC

ϕ30 μm InGaAs APD IN COAXIAL PACKAGE FOR FIBER OPTIC COMMUNICATION AND OTDR APPLICATIONS

FEATURES

- **SMALL DARK CURRENT:**
  I_D = 5 nA
- **SMALL TERMINAL CAPACITANCE:**
  C_T = 0.35 pF at 0.9 V_{BR}
- **HIGH QUANTUM EFFICIENCY:**
  η = 90% at λ = 1310 nm, M = 1
  η = 77% at λ = 1550 nm, M = 1
- **HIGH SPEED RESPONSE:**
  f_C = 2.5 GHz at M = 10
- **DETECTING AREA SIZE:**
  ϕ30 μm
- **COAXIAL MODULE WITH SINGLE MODE FIBER (SM-9/125)**

DESCRIPTION

The NR8300FP-CC is an InGaAs avalanche photo diode module with single mode fiber. It is designed for optical test instruments, especially OTDR systems.

ELECTRO-OPTICAL CHARACTERISTICS (T_C = 25°C, unless otherwise specified)

PART NUMBER			NR8300FP-CC		
SYMBOLS	**PARAMETERS AND CONDITIONS**	**UNITS**	**MIN**	**TYP**	**MAX**
V_{BR}	Reverse Breakdown Voltage, I_D = 100 μA	V	50	70	100
δ	Temperature Coefficient of Reverse Breakdown Voltage[1]	%/°C		0.2	
I_D	Dark Current, V_R = V_{BR} x 0.9	nA		5	25
I_{DM}	Multiplied Dark Current, M = 2 to 10	nA		1	5
C_t	Terminal Capacitance, V_R = V_{BR} x 0.9, f = 1 MHz	pF		0.35	0.60
f_C	Cut-off Frequency, M = 10	GHz	2.5		
η	Quantum Efficiency, λ = 1310 nm, M = 1	%	76	90	
	λ = 1550 nm, M = 1		65	77	
S	Responsivity, λ = 1310 nm, M = 1	A/W	0.80	0.94	
	λ = 1550 nm, M = 1		0.81	0.96	
M	Multiplication Factor, λ = 1310 nm, I_{PO} = 1.0 μA, V_R = V (at I_D = 1 μA)	M	30	40	
X	Excess Noise Factor[2], λ = 1310 nm, 1 550 nm,			0.7	
F	I_{PO} = 1.0 μA, M = 10, f = 35 MHz, B = 1 MHz			5	
ORL	Optical Return Loss, SMF	dB	30		

Note: 1. $$\delta = \frac{V_{BR} < 25°C + \Delta T°C > - V_{BR} < 25°C>}{\Delta T°C > - V_{BR} < 25°C>}$$

2. $F = M^X$

ABSOLUTE MAXIMUM RATINGS[1]

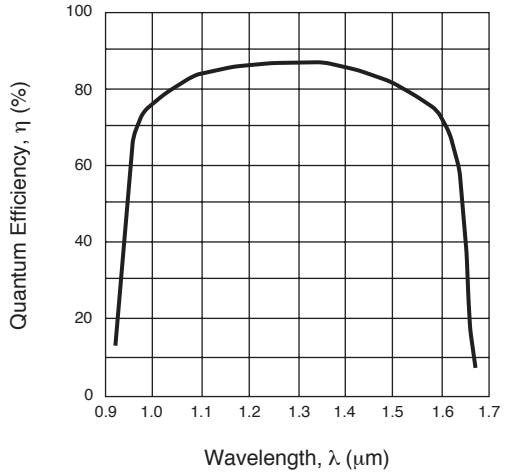
(T_C = 25°C, unless otherwise specified)

SYMBOLS	PARAMETERS	UNITS	RATINGS
I_F	Forward Current	mA	10
I_R	Reverse Current	mA	0.5
T_C	Operating Case Temp.	°C	-40 to +85
T_{STG}	Storage Temperature	°C	-40 to +85
T_{SOL}	Lead Soldering Temp.	°C	260 (10 sec.)
RH	Relative Humidity (noncondensing)	%	85

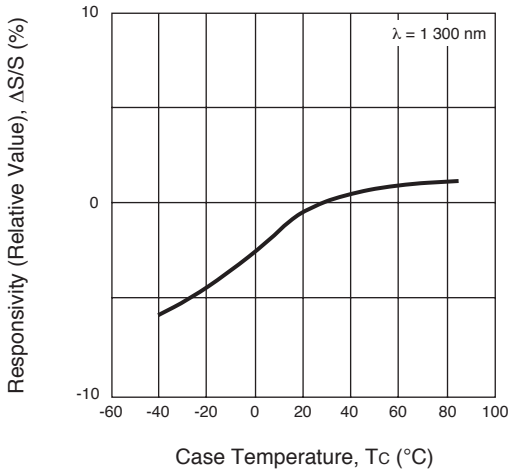
Note:
1. Operation in excess of any one of these parameters may result in permanent damage.

TYPICAL PERFORMANCE CURVES (T_C = 25°C, unless otherwise specified)

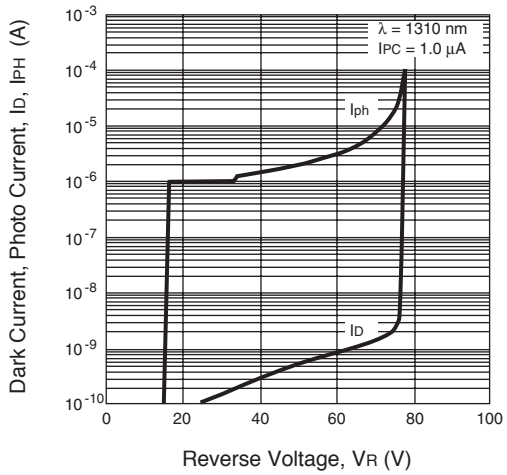
WAVELENGTH DEPENDENCE OF QUANTUM EFFICIENCY



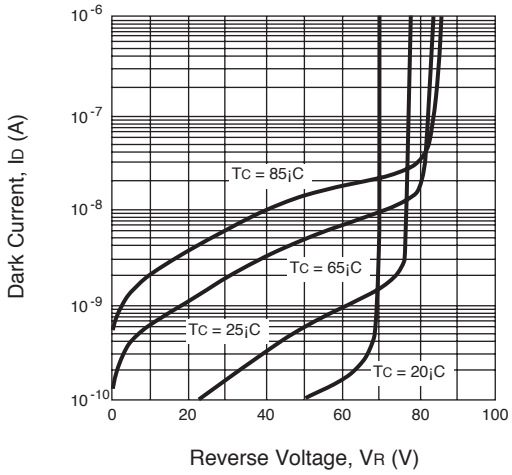
TEMPERATURE DEPENDENCE OF RESPONSIVITY



DARK CURRENT AND PHOTO CURRENT vs. REVERSE VOLTAGE

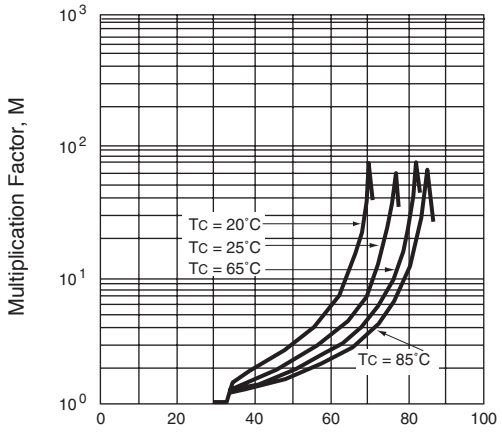


DARK CURRENT vs. REVERSE VOLTAGE

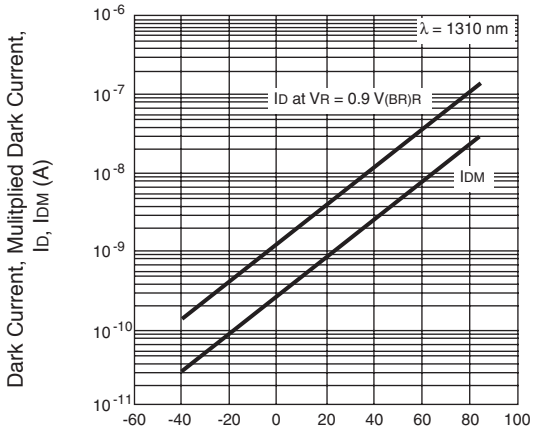


TYPICAL PERFORMANCE CURVES (T_C = 25°C)

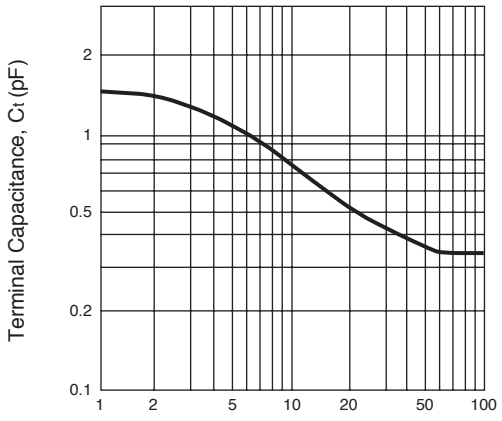
MULTIPLICATION FACTOR vs. REVERSE VOLTAGE



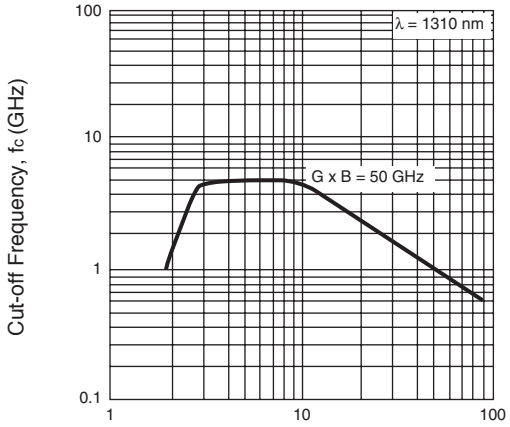
TEMPERATURE DEPENDENCE OF DARK CURRENT vs. MULTIPLIED DARK CURRENT



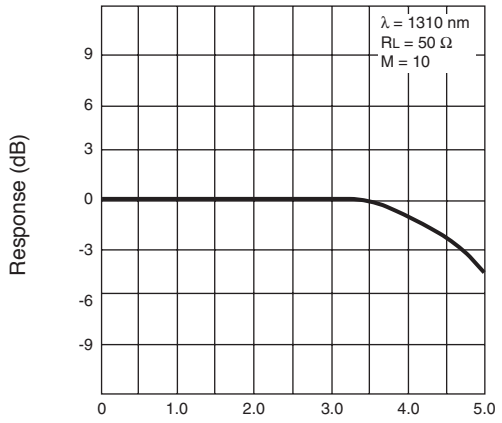
TERMINAL CAPACITANCE vs. REVERSE VOLTAGE



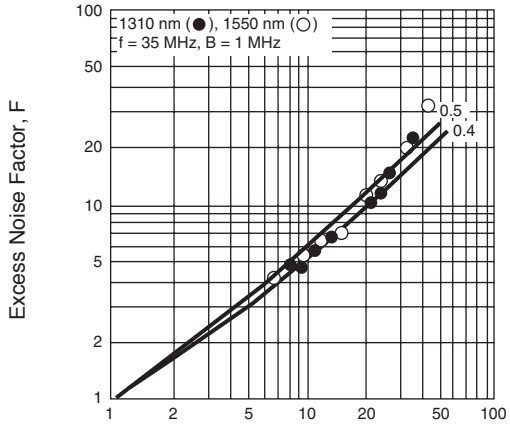
CUT-OFF FREQUENCY vs. MULTIPLICATION FACTOR



FREQUENCY RESPONSE



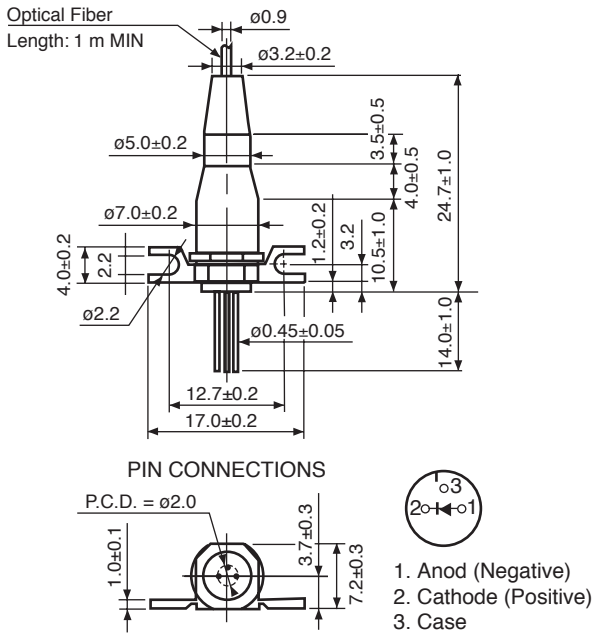
EXCESS NOISE FACTOR vs. MULTIPLICATION FACTOR



Remark: The graphs indicate nominal characteristics.

OUTLINE DIMENSIONS (Units in mm)

NR8300FP-CC



PIN CONNECTIONS

1. Anod (Negative)
2. Cathode (Positive)
3. Case

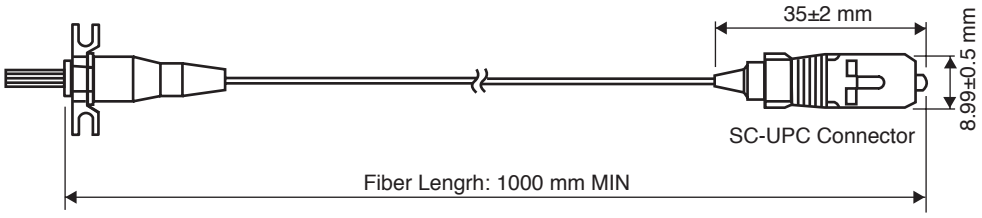
ORDERING INFORMATION

Part Number	Flange Type	Fiber Type	Available Connector
NR8300FP-CC-AZ*	Flat Mount Flange	SMF	With SC-UPC Connector

***NOTE:**
Please refer to the last page of this data sheet, “Compliance with EU Directives” for Pb-Free RoHS Compliance Infomation.

OPTICAL FIBER CHARACTERISTICS

PARAMETER	SPECIFICATION	UNIT
Mode Field Diameter	9.5±1	μm
Core Diameter	—	μm
Cladding Diameter	125±2	μm
Maximum Cladding Noncircularity	2	%
Maximum Core/Cladding Concentricity	1.6	%
Outer Diameter	0.9±0.1	mm
Cut-off Wavelength	1100 to 1270	nm
Minimum Fiber Bending Radius	30	mm
Fiber Length	1000 Min.	mm
Flammability	UL1581 VW-1	



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