CEL

NEC's ø30 μm InGaAs APD IN DIP PACKAGE FOR OTDR APPLICATION

NR8360JP-BC

FEATURES

- **HIGH QUANTUM EFFICIENCY:**
  η = 85 % @ λ = 1310 nm
  η = 80 % @ λ = 1550 nm
- **SMALL DARK CURRENT:** I_D = 2 nA
- **HIGH-SPEED RESPONSE:** f_C = 1.2 GHz @ M = 20
- **INTERNAL THERMOELECTRIC COOLER**
- **HERMETICALLY SEALED**
  14-PIN DUAL IN-LINE PACKAGE

DESCRIPTION

NEC's NR8360JP-BC is an InGaAs avalanche photodiode module with single mode fiber. A thermoelectric cooler is integrated enabling the temperature control of the APD chip. It is designed for long-reach optical communications and optical test instruments, especially OTDR.

ELECTRO-OPTICAL CHARACTERISTICS (T_{APD} = 25°C, T_C = -20 to +55°C, unless otherwise specified)

PART NUMBER			NR8360JP-BC		
SYMBOLS	**PARAMETERS AND CONDITIONS**	**UNITS**	**MIN**	**TYP**	**MAX**
V_{BR}	Reverse Breakdown Voltage, I_D = 100 μA	V	50	70	100
δ[1]	Temperature Coefficient of Reverse Breakdown Voltage	%/°C		0.2	
I_D	Dark Current, $V_R = V_{BR}$ X 0.9 $V_R = V_{BR}$ X 0.9, T_C = 55°C, I_C = 0.8 A	nA nA		5 2	10 5
I_{DM}	Multiplied Dark Current, M = 2 to 10	nA		0.2	2.0
C_t	Terminal Capacitance, $V_R = V_{BR}$ X 0.9, f = 1 MHz	pF		1.0	1.7
f_C	Cut-off Frequency, M = 10 M = 20	GHz GHz	1.0	 1.2	
η	Quantum Efficiency, λ = 1310 nm λ = 1550 nm	% %	70 65	85 80	
S	Sensitivity, λ = 1310 nm λ = 1550 nm	A/W A/W	0.73	0.89 1.00	
M	Multiplication Factor, λ = 1310 nm, I_{OP} = 1.0 μA, V_R = V (@ I_D = 1 μA)		20	40	
X F	Excess Noise Factor[2], λ = 1310 nm, 1550 nm, I_{OP} = 1.0 μA, M = 10, f = 35 MHz, B = 1 MHz			0.7 5	
R	Thermistor Resistance	kΩ	9.5	10.0	10.5
B	B Constant	K	3350	3450	3550
I_C	Cooler Current, ΔT = 45°C	A		0.6	0.8
V_C	Cooler Voltage, I_C = 0.8 A	V		1.1	1.5
ΔT[3]	Cooling Capacity, I_C = 0.8 A	°C	45		

Notes:

1. $\delta = \dfrac{V_{BR}\ (25°C + \Delta T\ °C) - V_{(BR}\ (25°C)}{\Delta T\ °C \bullet V_{BR}\ (25°C)}$

2. $F = M^X$

3. $\Delta T = |T_C - T_{APD}|$

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	μA	500
T_C	Operating Case Temperature	°C	-20 to +55
T_{STG}	Storage Temperature	°C	-40 to +85
T_{SLD}	Lead Soldering Temperature (10 s)	°C	260
I_C	Cooler Current	A	1.0
V_C	Cooler Voltage	V	2.0

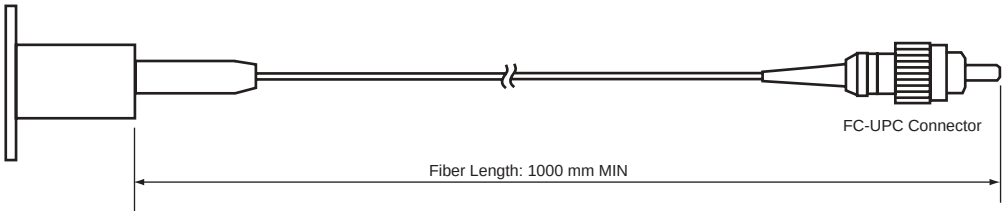
Note:
1. Operation in excess of any one of these parameters may result in permanent damage.

ORDERING INFORMATION

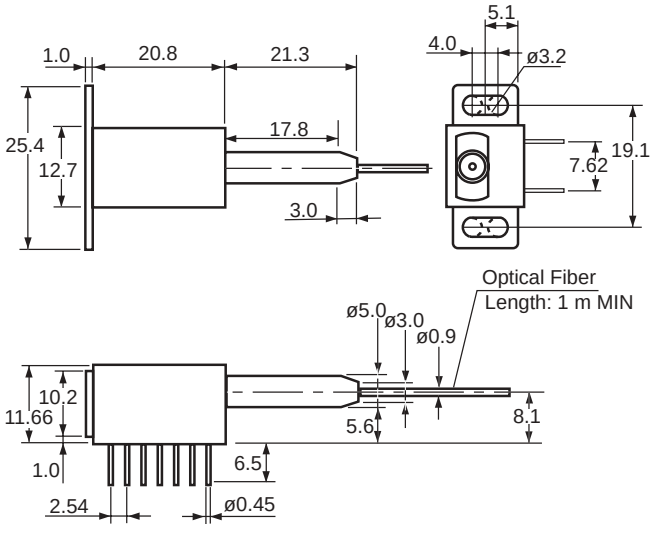
Part Number	Available Connector
NR8360JP-BC	With FC-UPC Connector

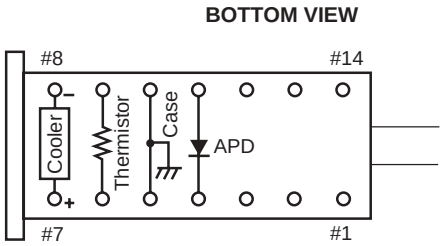
OPTICAL FIBER CHARACTERISTICS

PARAMETER	SPECIFICATION	UNIT
Mode Field Diameter	9.5±1	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	ULT1581 VW-1	



OUTLINE DIMENSIONS (Units in mm)





PIN CONNECTIONS

PIN No.	FUNCTION	PIN No.	FUNCTION
1	NC	8	COOLER CATHODE
2	NC	9	THERMISTOR
3	NC	10	CASE GROUND
4	APD CATHODE	11	APD ANODE
5	CASE GROUND	12	NC
6	THERMISTOR	13	NC
7	COOLER ANODE	14	NC

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4590 Patrick Henry Drive • Santa Clara, CA 95054-1817 • (408) 988-3500 • FAX (408) 988-0279 • **www.cel.com**