

PRELIMINARY DATA SHEET



NEC's $\phi 30 \mu\text{m}$ InGaAs APD IN DIP PACKAGE FOR OTDR APPLICATION

NR8360JP-BC

FEATURES

- **HIGH QUANTUM EFFICIENCY:**
 $\eta = 85\% @ \lambda = 1310 \text{ nm}$
 $\eta = 80\% @ \lambda = 1550 \text{ nm}$
- **SMALL DARK CURRENT:** $I_D = 2 \text{ nA}$
- **HIGH-SPEED RESPONSE:** $f_c = 1.2 \text{ GHz @ } M = 20$
- **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, $\lambda = 1310 \text{ nm}$ $\lambda = 1550 \text{ nm}$	% %	70 65	85 80	
S	Sensitivity, $\lambda = 1310 \text{ nm}$ $\lambda = 1550 \text{ nm}$	A/W A/W	0.73	0.89 1.00	
M	Multiplication Factor, $\lambda = 1310 \text{ nm}$, I _{OP} = 1.0 μA , V _R = V (@ I _D = 1 μA)		20	40	
X F	Excess Noise Factor ² , $\lambda = 1310 \text{ nm}$, 1550 nm, I _{OP} = 1.0 μA , M = 10, f = 35 MHz, B = 1 MHz			0.7 5	
R	Thermistor Resistance	k Ω	9.5	10.0	10.5
B	B Constant	K	3350	3450	3550
I _C	Cooler Current, $\Delta T = 45^\circ\text{C}$	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:

$$1. \delta = \frac{V_{BR}(25^\circ\text{C} + \Delta T) - V_{BR}(25^\circ\text{C})}{\Delta T \cdot V_{BR}(25^\circ\text{C})}$$

$$2. F = M^X$$

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

NR8360JP-BC

ABSOLUTE MAXIMUM RATINGS¹

(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:

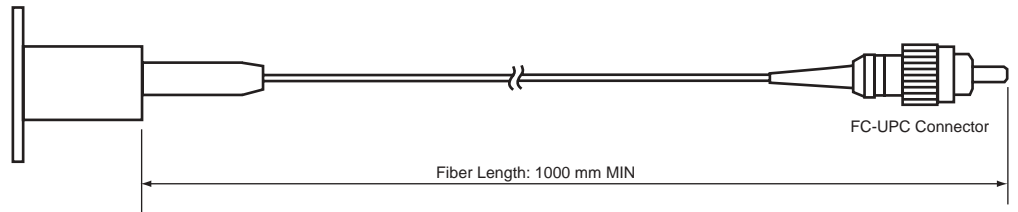
- Operation in excess of any one of these parameters may result in permanent damage.

ORDERING INFORMATION

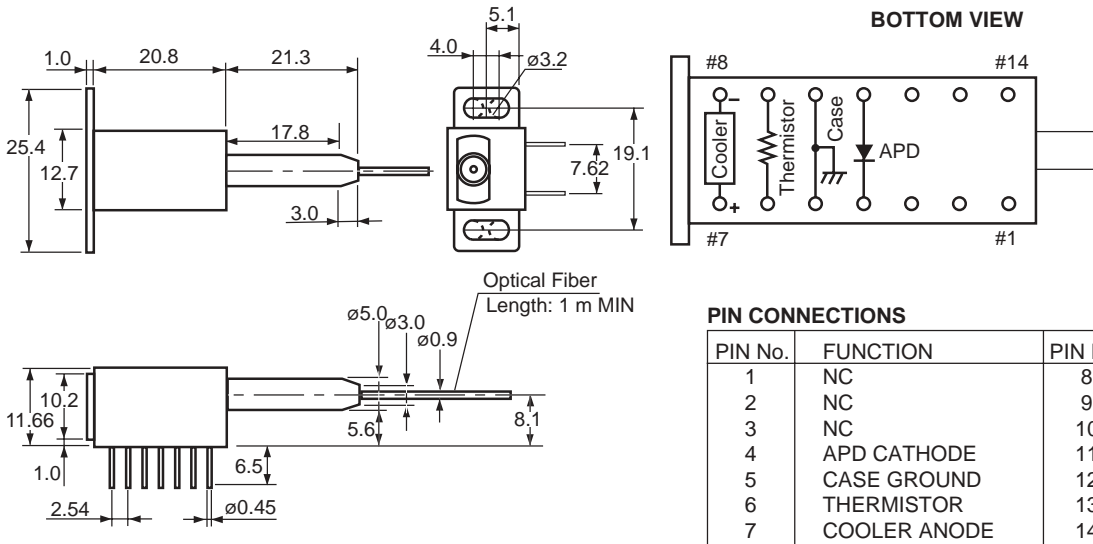
Part Number	Available Connector
NR8360JP-BC	With FC-UPC Connector

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)



Life Support Applications

These NEC products are not intended for use in life support devices, appliances, or systems where the malfunction of these products can reasonably be expected to result in personal injury. The customers of CEL using or selling these products for use in such applications do so at their own risk and agree to fully indemnify CEL for all damages resulting from such improper use or sale.

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