

To our customers,

Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: <http://www.renesas.com>

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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**ϕ 80 μ m InGaAs AVALANCHE PHOTO DIODE MODULE
FOR OTDR APPLICATIONS**

DESCRIPTION

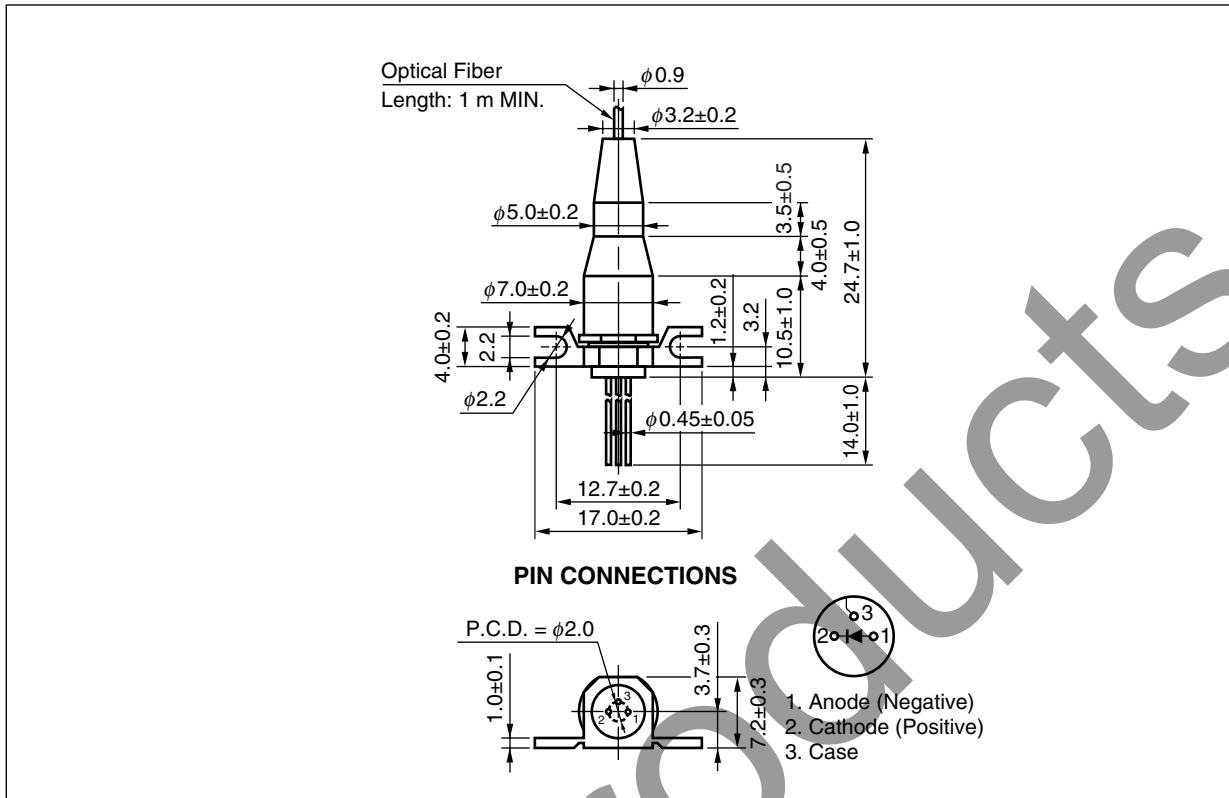
The NR8800FS-CB is an InGaAs avalanche photo diode module with multi mode fiber, and can be used in OTDR systems.

FEATURES

- Small dark current $I_D = 7$ nA
- Small terminal capacitance $C_t = 0.5$ pF @ 0.9 V_{(BR)R}
- High sensitivity $S = 0.94$ A/W @ $\lambda = 1310$ nm, M = 1
- Detecting area size ϕ 80 μ m
- Coaxial module with multi mode fiber (GI-62.5)

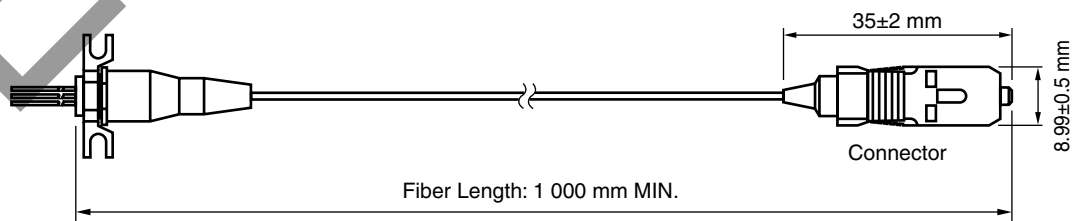
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PACKAGE DIMENSIONS (UNIT: mm)



OPTICAL FIBER CHARACTERISTICS

Parameter	Specification	Unit
	GI-62.5 Fiber	
Core Diameter	62.5 \pm 3	μ m
Cladding Diameter	125 \pm 2	μ m
Maximum Cladding Noncircularity	2	%
Maximum Core/Cladding Concentricity	4.0	%
Outer Diameter	0.9 \pm 0.1	mm
Minimum Fiber Bending Radius	30	mm
Fiber Length	1 000 MIN.	mm
Flammability	UL1581 VW-1	



ORDERING INFORMATION

Part Number	Flange Type	Fiber Type	Available Connector
NR8800FS-CB	Flat Mount Flange	GI-62.5 Fiber	With SC-SPC Connector

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Ratings	Unit
Forward Current	I_F	10	mA
Reverse Current	I_R	1.0	mA
Operating Case Temperature	T_C	-40 to +85	°C
Storage Temperature	T_{stg}	-40 to +85	°C
Lead Soldering Temperature	T_{sld}	350 (3 sec.)	°C
Relative Humidity (noncondensing)	RH	85	%

EOL products

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

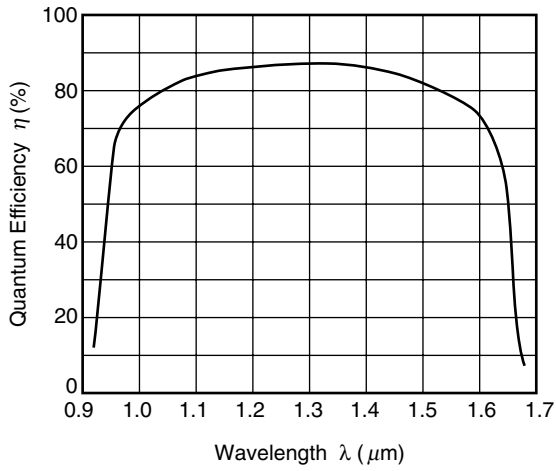
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Reverse Breakdown Voltage	V _{BR}	I _D = 100 μA	50	70	100	V
Temperature Coefficient of Reverse Breakdown Voltage	δ ^{*1}			0.2		%/°C
Dark Current	I _D	V _R = V _{BR} × 0.9		7	30	nA
Multiplied Dark Current	I _{DM}	M = 2 to 10		1	5	nA
Terminal Capacitance	C _t	V _R = V _{BR} × 0.9, f = 1 MHz		0.5	0.75	pF
Sensitivity	S	λ = 1 310 nm, M = 1	0.8	0.94		A/W
Multiplication Factor	M	λ = 1 310 nm, I _{po} = 1.0 μA, V _R = V (@ I _D = 1 μA)	30	70		
Excess Noise Factor ^{*2}	x	λ = 1 310 nm, I _{po} = 1.0 μA,		0.7		
	F	M = 10, f = 35 MHz, B = 1 MHz		5		
Optical Return Loss	ORL	GI-62.5, λ = 1 310 nm	28			dB

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

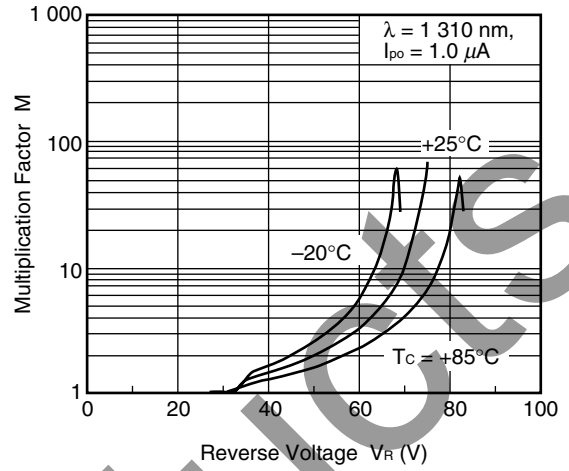
*2 $F = M^x$

<R> TYPICAL CHARACTERISTICS (T_c = 25°C, unless otherwise specified)

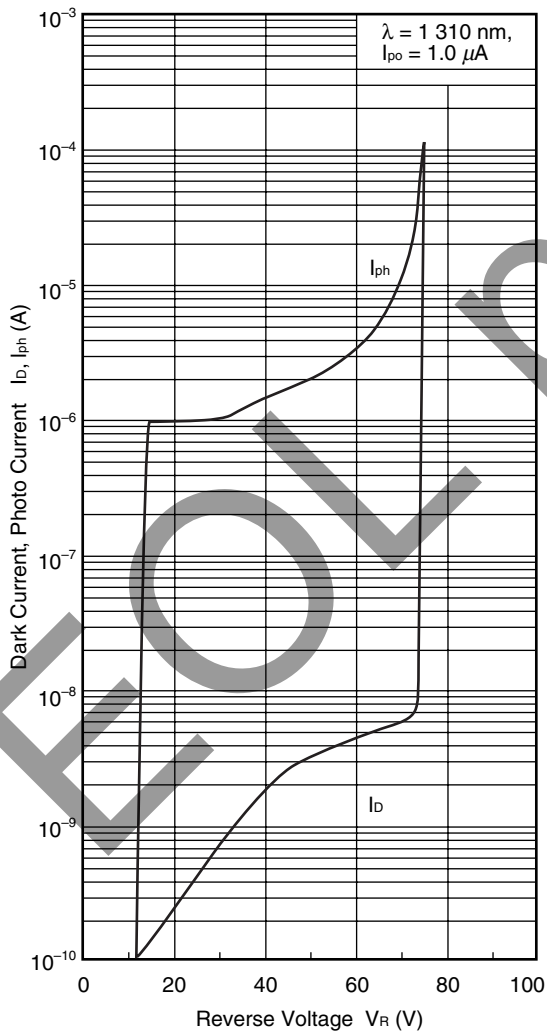
WAVELENGTH DEPENDENCE OF QUANTUM EFFICIENCY



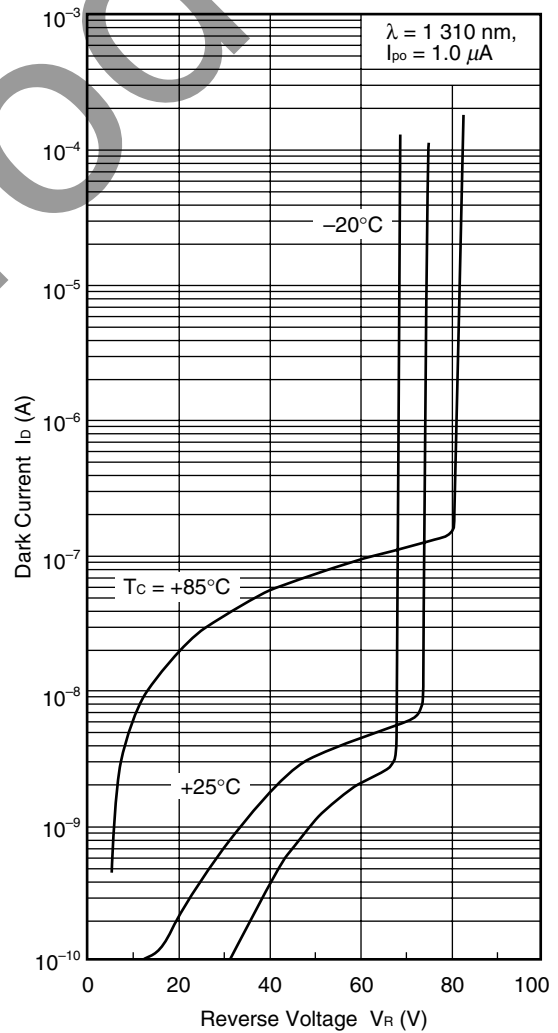
MULTIPLICATION FACTOR vs. REVERSE VOLTAGE



DARK CURRENT, PHOTO CURRENT vs. REVERSE VOLTAGE



DARK CURRENT vs. REVERSE VOLTAGE



Remark The graphs indicate nominal characteristics.

REFERENCE

Document Name	Document No.
Opto-Electronics Devices Pamphlet	PX10160E

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<p>Caution Optical Fiber</p>	<p>A glass-fiber is attached on the product. Handle with care.</p> <ul style="list-style-type: none"> • When the fiber is broken or damaged, handle carefully to avoid injury from the damaged part or fragments.

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