

# NR4211TH

RECEIVER (Limiting TIA, with DCA function)

R08DS0022EJ0100

Rev.1.00

InAlAs APD RECEIVER WITH INTERNAL PRE-AMPLIFIER FOR 10 Gb/s APPLICATIONS

Sep 13, 2012

## DESCRIPTION

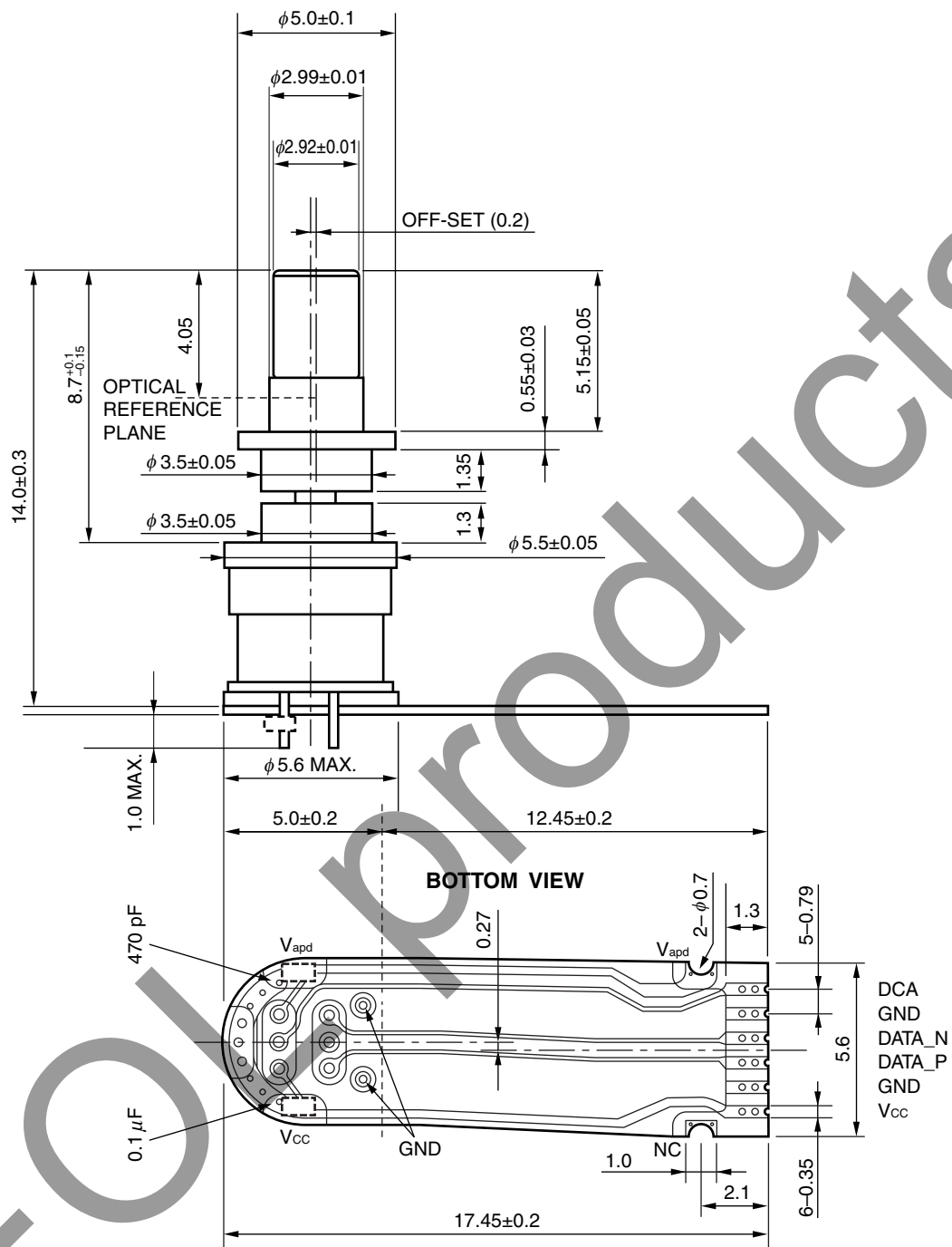
The NR4211TH product consists of InAlAs-APD (avalanche photo diode) ROSAs (Receiver Optical Sub-Assembly) with internal pre-amplifiers designed for 10 Gb/s long-reach optical transceivers such as the XENPAK/X2/XFP and Transponder. These modules are ideal as receivers for IEEE 10G BASE and SONET OC-192 systems and D-WDM systems.

## FEATURES

- XMD-MSA compliant ROSA
- 10 Gb/s high sensitivity InAlAs-APD
- +3.3 V transimpedance pre-amplifier
- Minimum receiver sensitivity  $P_r = -27.5 \text{ dBm}$
- Operating case temperature  $T_c = -5 \text{ to } +90^\circ\text{C}$
- Transimpedance  $Z_t = 6\,000 \Omega$  (Single-ended)
- Cut-off frequency  $f_c = 7.5 \text{ GHz}$
- With DCA function (Cross point control)
- With flexible printed circuit

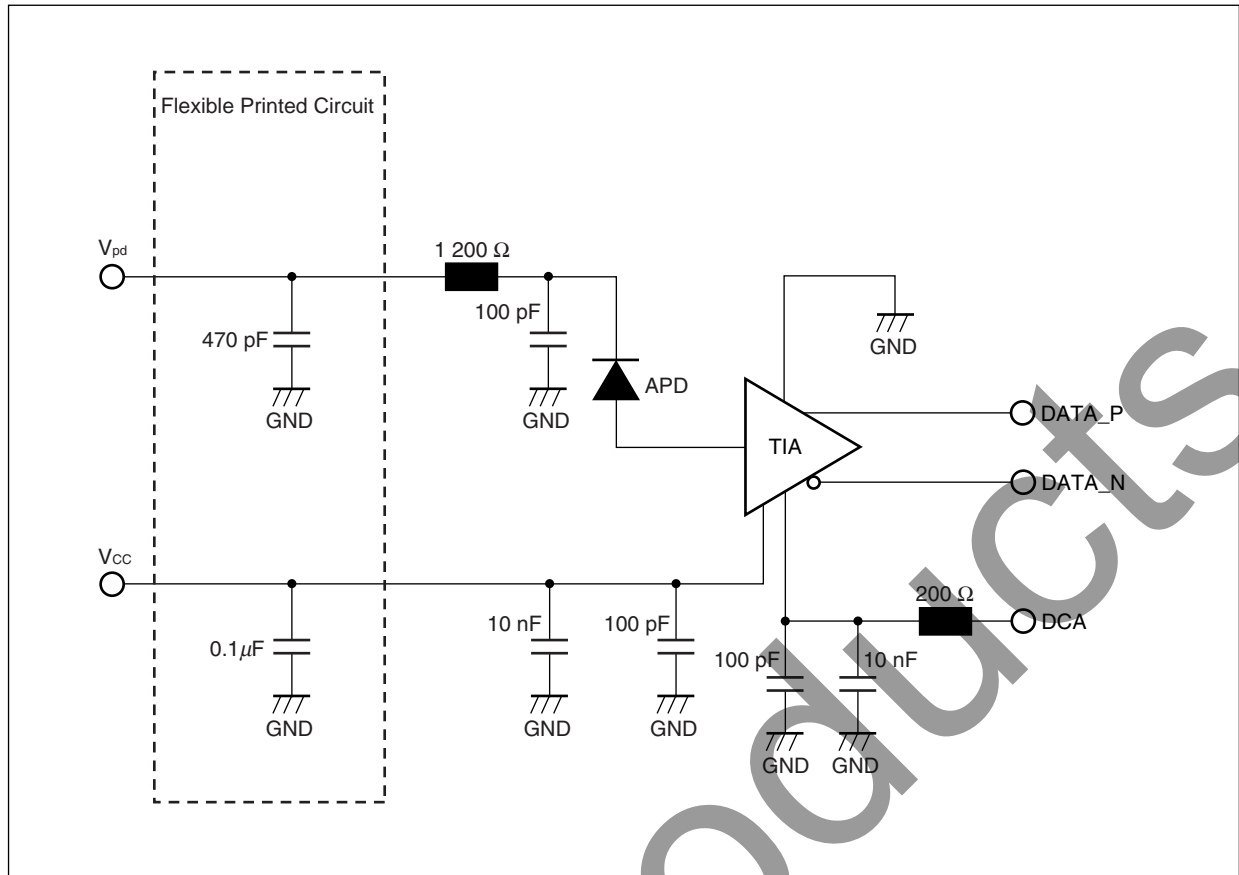


## PACKAGE DIMENSIONS (UNIT: mm)



**Remark** Tolerance is  $\pm 0.1$  unless otherwise specified.

## BLOCK DIAGRAM



**ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ , unless otherwise specified)**

Parameter	Symbol	Ratings	Unit
APD Reverse Voltage	$V_R$	$V_{BR}$	V
APD Reverse Current	$I_{R(\text{peak})}$	4	mA
Maximum Optical Input Power	$P_{in(\text{peak})}$	3	dBm
Maximum Optical Input Power (with 7.5 k $\Omega$ serial resistance)		7	
IC Supply Voltage	$V_{CC}$	-0.5 to +3.7	V
DCA Voltage	$V_{DCA}$	0 to +4 and $< V_{CC}+0.5$	V
Operating Case Temperature	$T_C$	-5 to +90	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-40 to +90	$^\circ\text{C}$
Lead Soldering Temperature (Flexible Printed Circuit)	$T_{sld}$	260 (10 sec.)	$^\circ\text{C}$

**ELECTRO-OPTICAL CHARACTERISTICS**(T<sub>C</sub> = -5 to +90°C, V<sub>CC</sub> = +3.13 to +3.47 V, λ = 1 550 nm, unless otherwise specified)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
APD Sensitivity	S	λ = 1 310 nm, M = 1	0.75	0.9		A/W
		λ = 1 550 nm, M = 1	0.75	0.9		
APD Breakdown Voltage	V <sub>BR</sub>	I <sub>D</sub> = 10 μA			36	V
Temperature Coefficient of APD Breakdown Voltage	δ <sup>*1</sup>		0	0.02	0.05	V/°C
APD Dark Current	I <sub>D</sub>	V <sub>R</sub> = V <sub>BR</sub> × 0.9, T <sub>C</sub> = 25°C			0.7	μA
IC Supply Current	I <sub>CC</sub>				50	mA
DCA input Voltage	V <sub>DCA</sub>		2.5		3.5	V
DCA current	I <sub>DCA</sub>		-30		30	μA
Transimpedance	Z <sub>t</sub>	Single-ended	3 000	6 000	10 000	Ω
Maximum Output Voltage Swing	V <sub>clip</sub>	Single-ended			350	mV <sub>PP</sub>
Cut-off Frequency	f <sub>C</sub>	M = 9, P <sub>in</sub> = -27 dBm	6	7.5		GHz
RF Output Return Loss	S <sub>22</sub>	1G-6G, M = 9, Single-ended			-5	dB
Minimum Receiver Sensitivity	P <sub>r</sub>	9.95 Gb/s, BER = 10 <sup>-12</sup> , M <sub>opt</sub> , PRBS = 2 <sup>31</sup> -1, ER = 13 dB, NRZ		-27.5	-26.0	dBm
Overload	P <sub>O</sub>	9.95 Gb/s, BER = 10 <sup>-12</sup> , M <sub>opt</sub> , PRBS = 2 <sup>31</sup> -1, ER = 13 dB, NRZ	-6.5			dBm
Optical Return Loss	ORL	λ = 1 310 nm			-27	dB
		λ = 1 550 nm			-27	

Note: \*1.  $\delta = \frac{\Delta V_{BR}}{\Delta T_C}$

## SAFETY INFORMATION ON THIS PRODUCT

**Caution**

GaAs Products

This product uses gallium arsenide (GaAs).

GaAs vapor and powder are hazardous to human health if inhaled or ingested, so please observe the following points.

- Follow related laws and ordinances when disposing of the product. If there are no applicable laws and/or ordinances, dispose of the product as recommended below.
  1. Commission a disposal company able to (with a license to) collect, transport and dispose of materials that contain arsenic and other such industrial waste materials.
  2. Exclude the product from general industrial waste and household garbage, and ensure that the product is controlled (as industrial waste subject to special control) up until final disposal.
- Do not burn, destroy, cut, crush, or chemically dissolve the product.
- Do not lick the product or in any way allow it to enter the mouth.

<b>Revision History</b>	<b>NR4211TH Data Sheet</b>
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Rev.	Date	Description	
		Page	Summary
1.00	Sep 13, 2012	–	First edition issued

EOOL products

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