



RECEIVER NR4210 Series

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

DESCRIPTION

The NR4210 Series products consist of InAIAs-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. These modules are ideal as receivers for IEEE 10G BASE and SONET OC-192 systems.

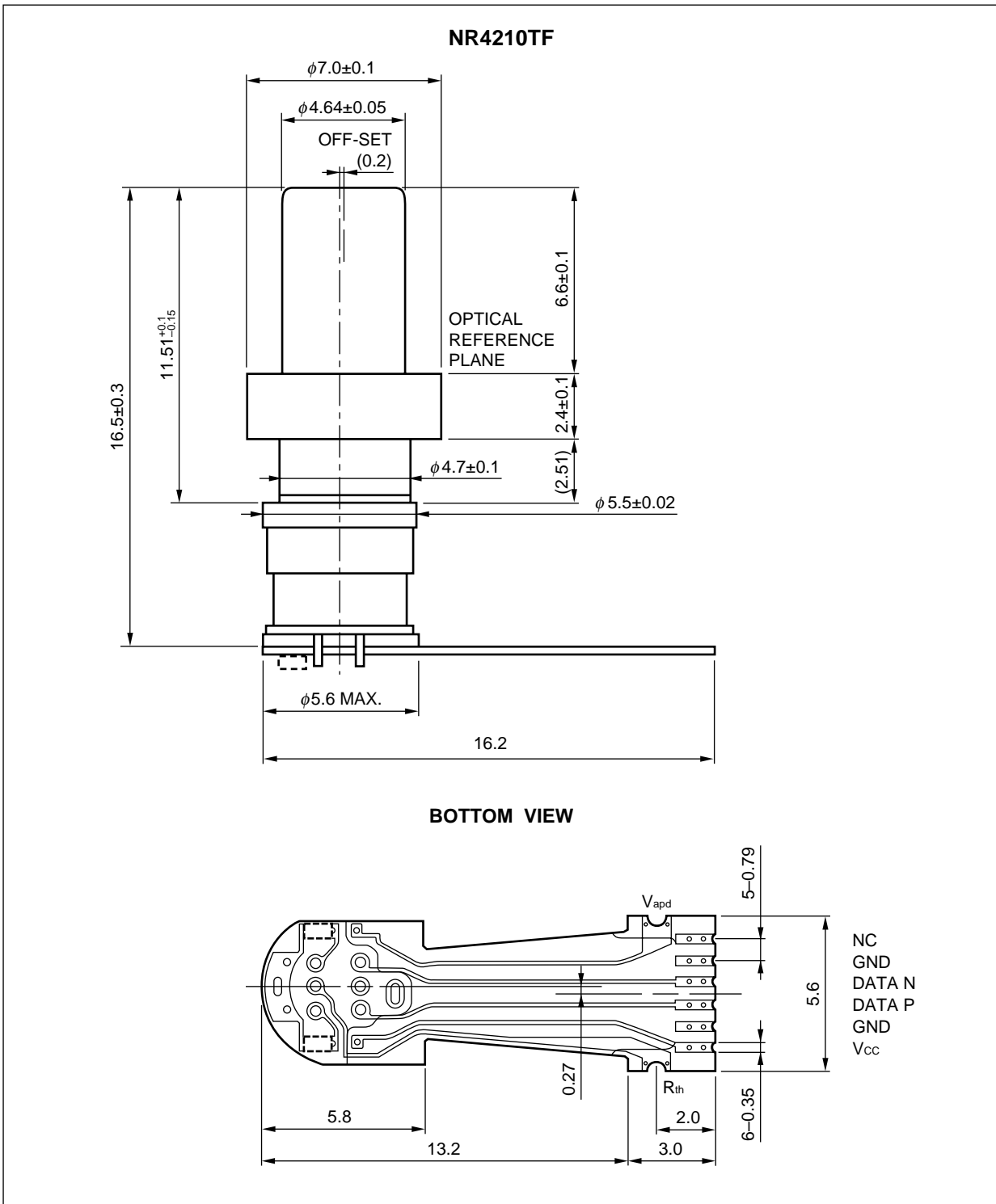
FEATURES

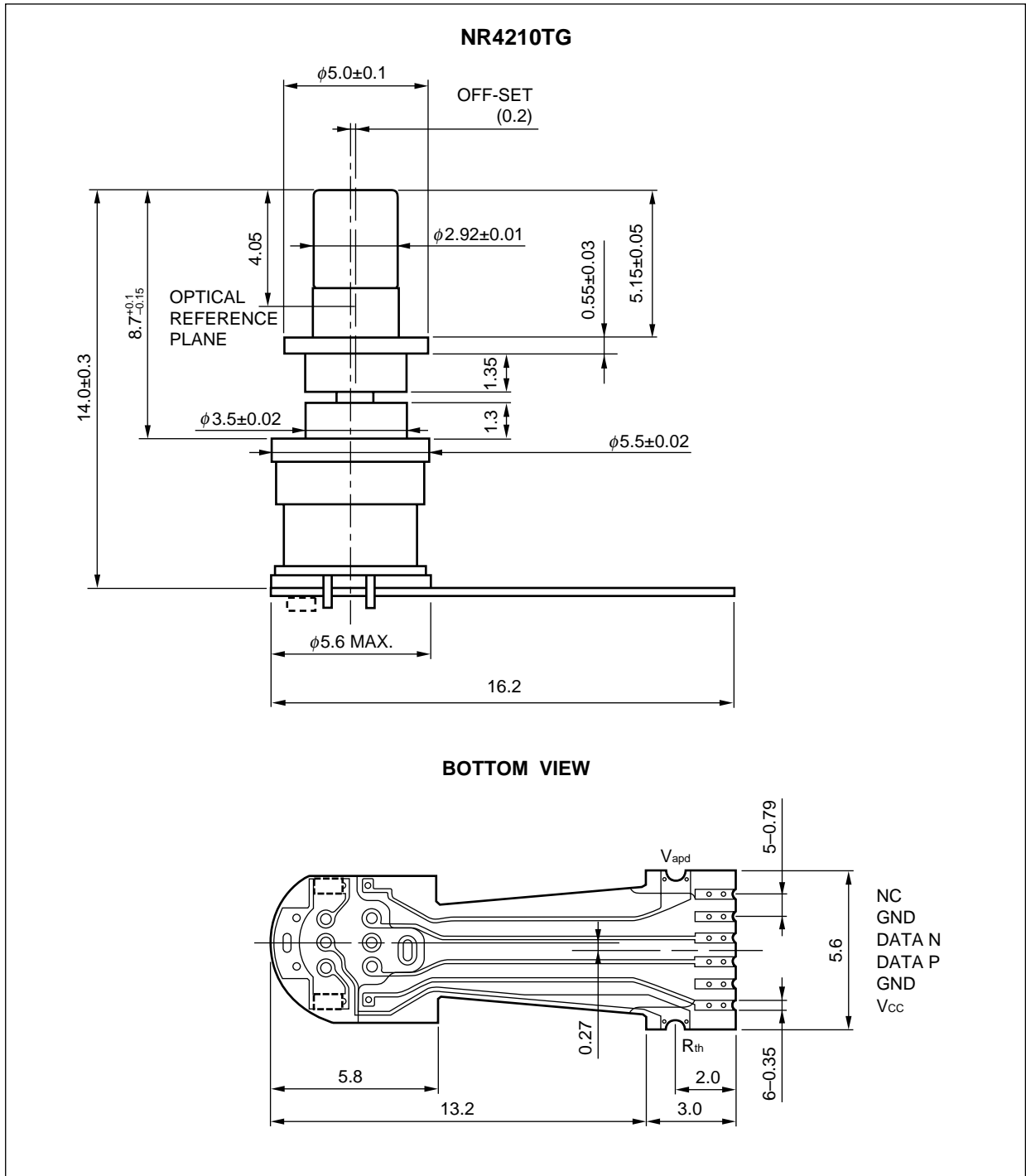
- XMD-MSA compliant ROSA
- 10 Gb/s high sensitivity InAIAs-APD
- +3.3 V SiGe transimpedance pre-amplifier
- Minimum receiver sensitivity $\bar{P}_r = -28$ dBm
- Operating case temperature $T_c = -5$ to $+85^\circ\text{C}$
- Transimpedance $Z_t = 2\,000\ \Omega$ (Single-ended)
- Cut-off frequency $f_c = 8$ GHz
- With flexible printed circuit

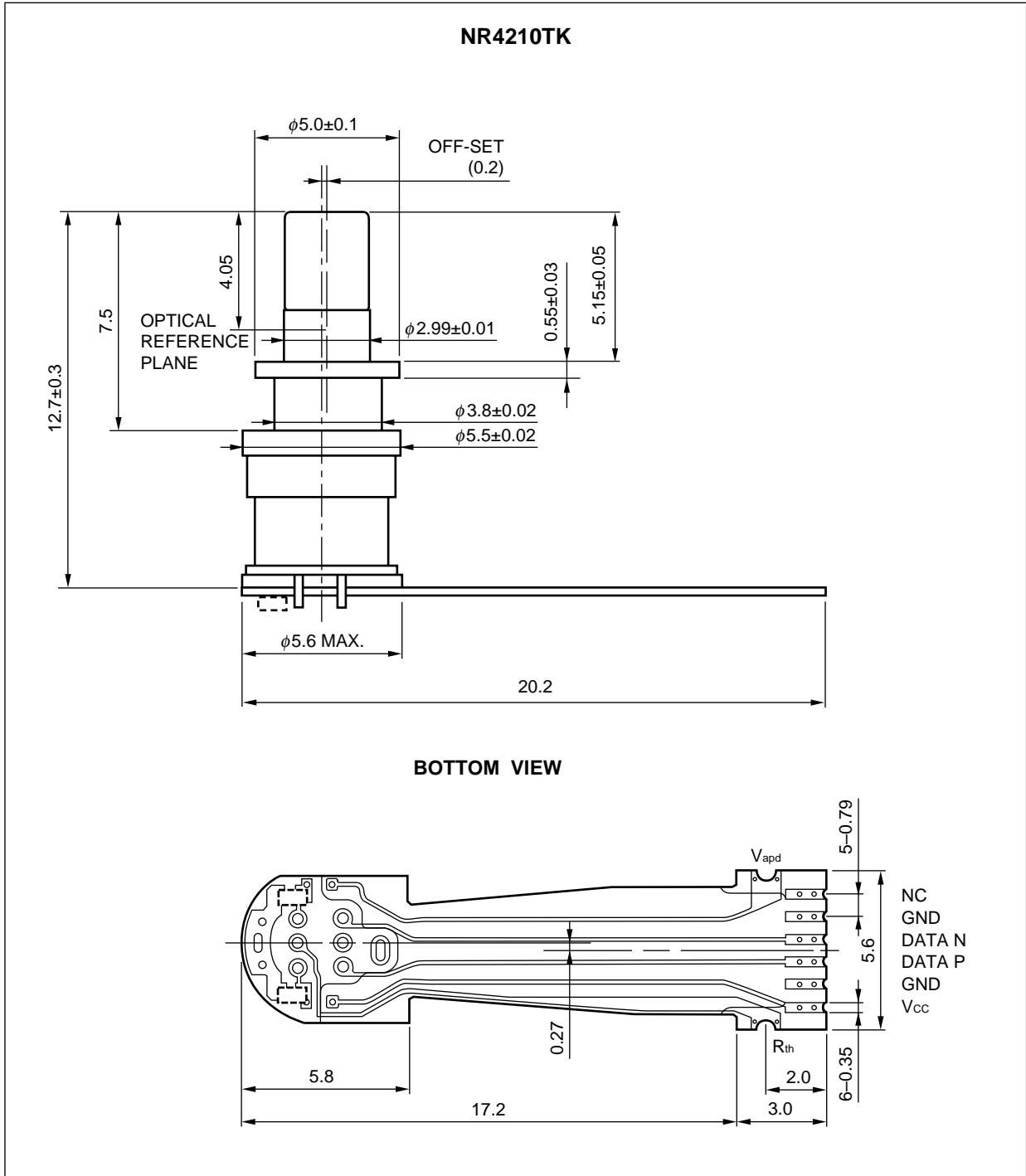


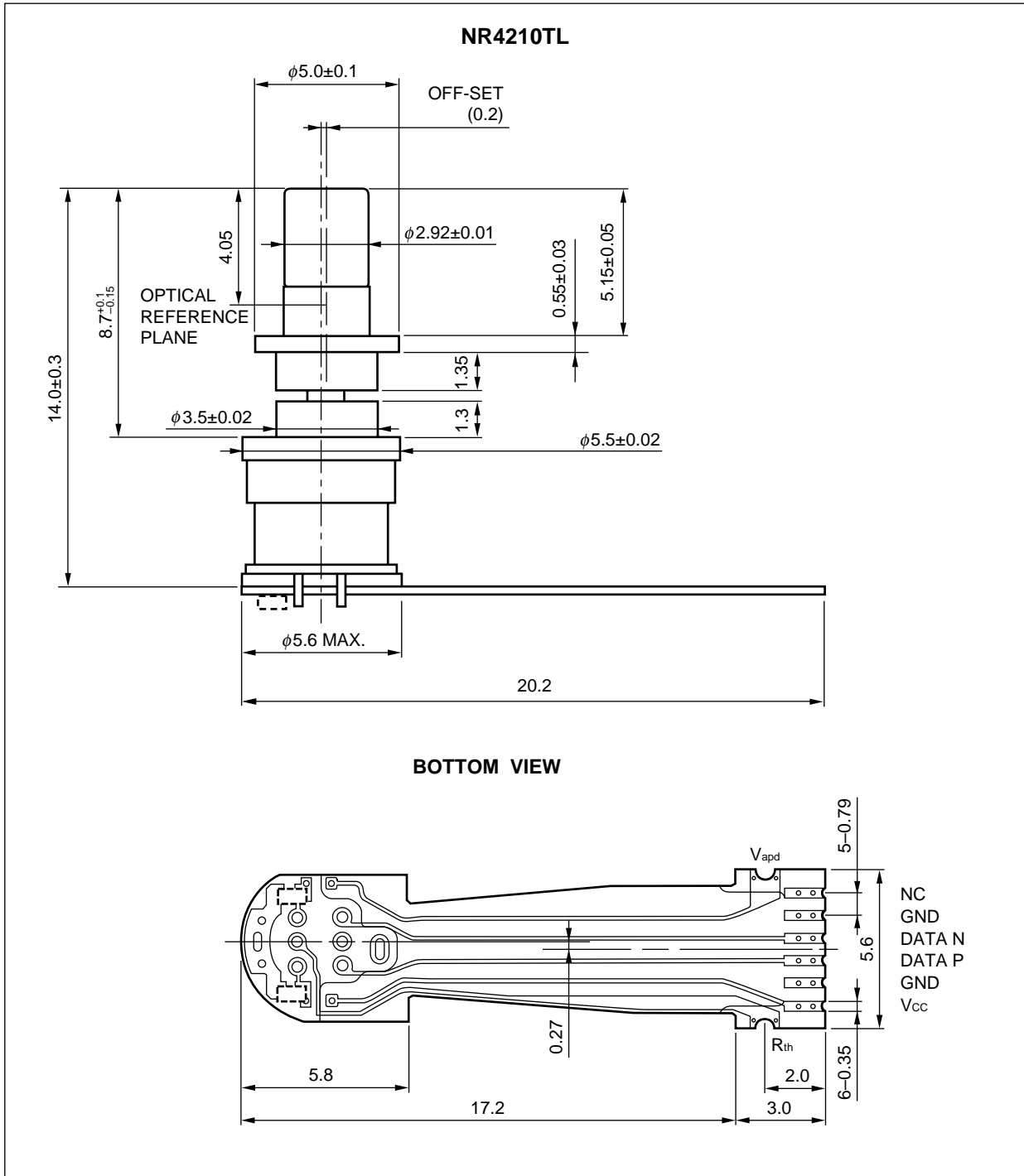
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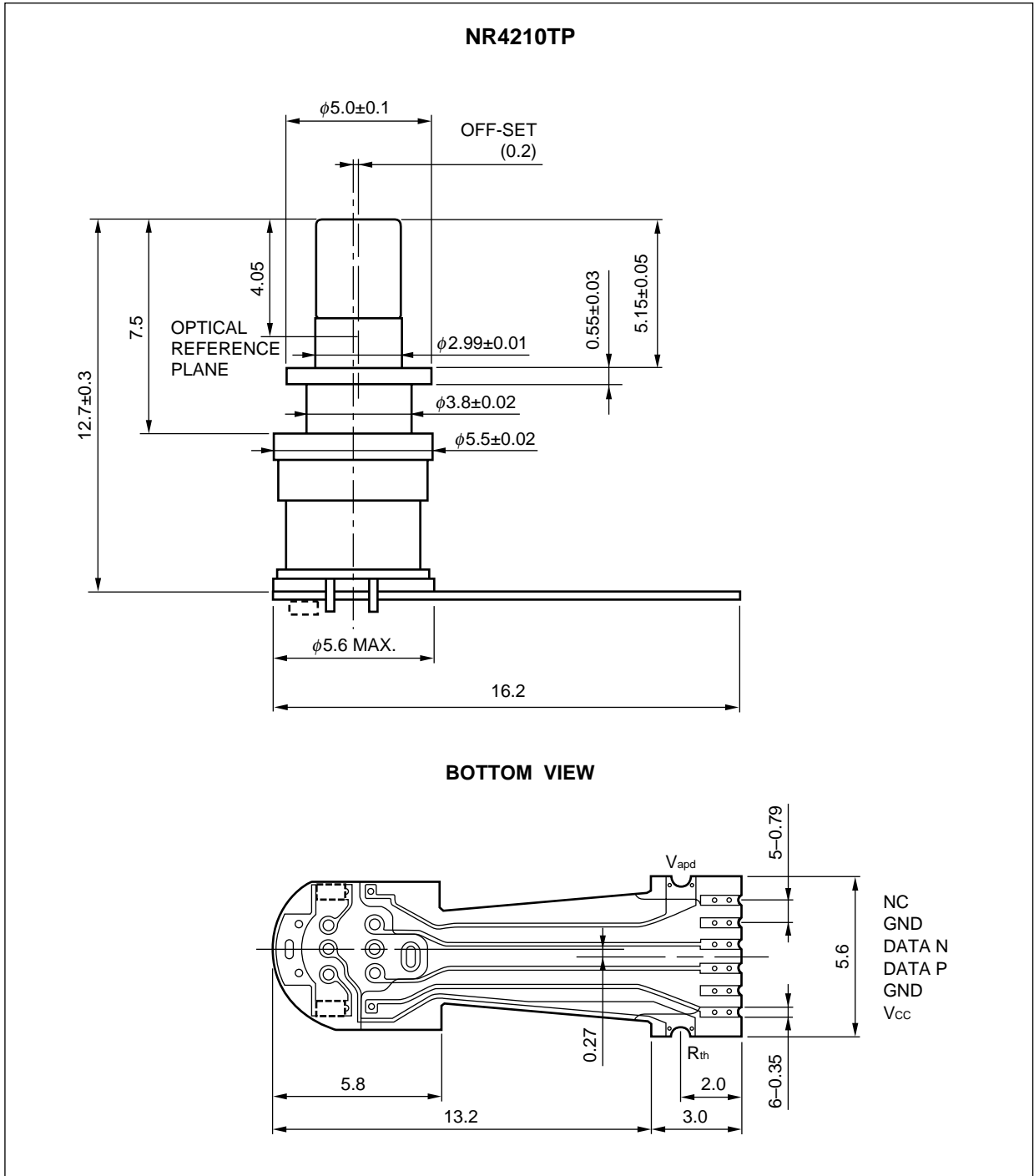
PACKAGE DIMENSIONS (UNIT: mm)

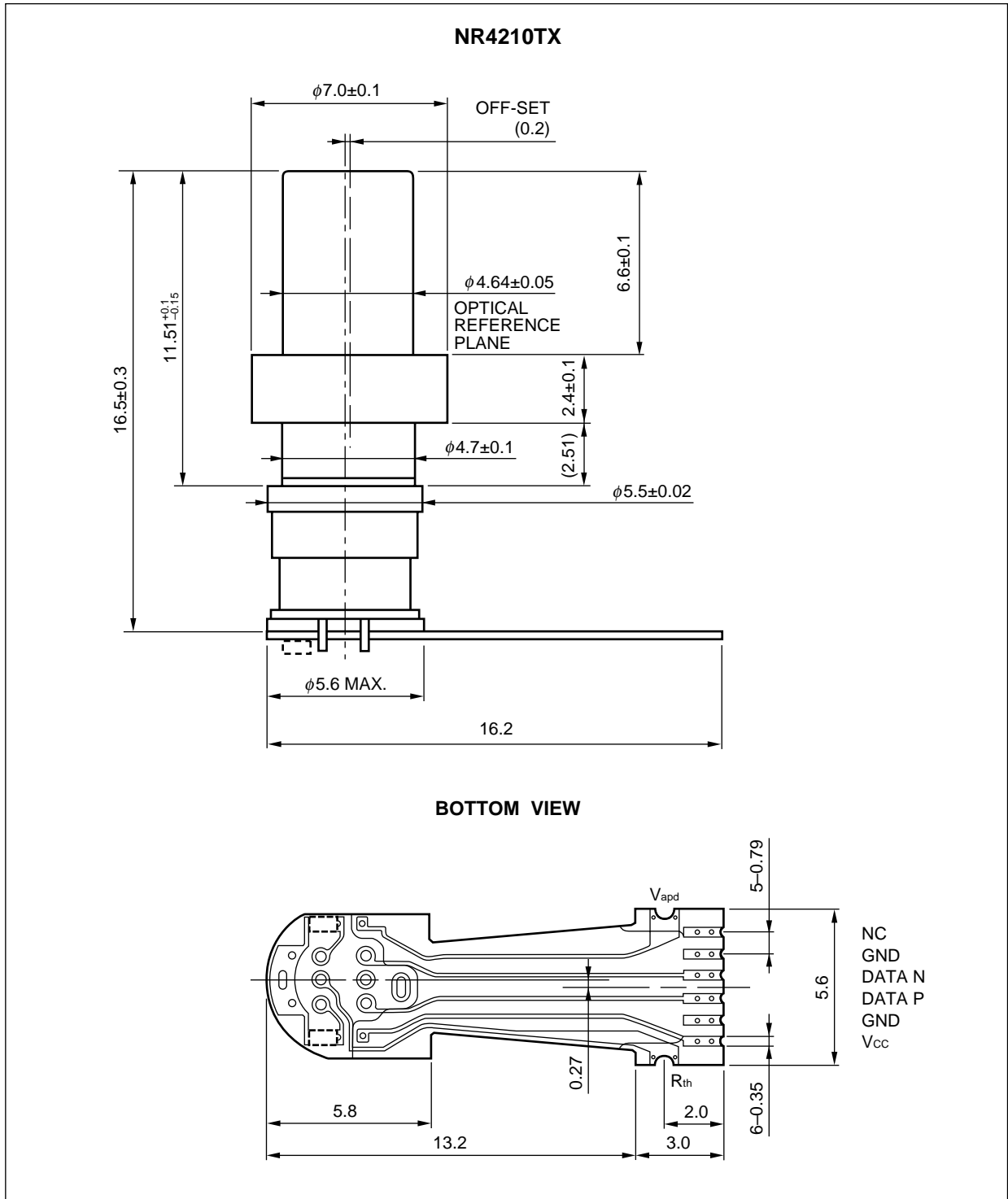




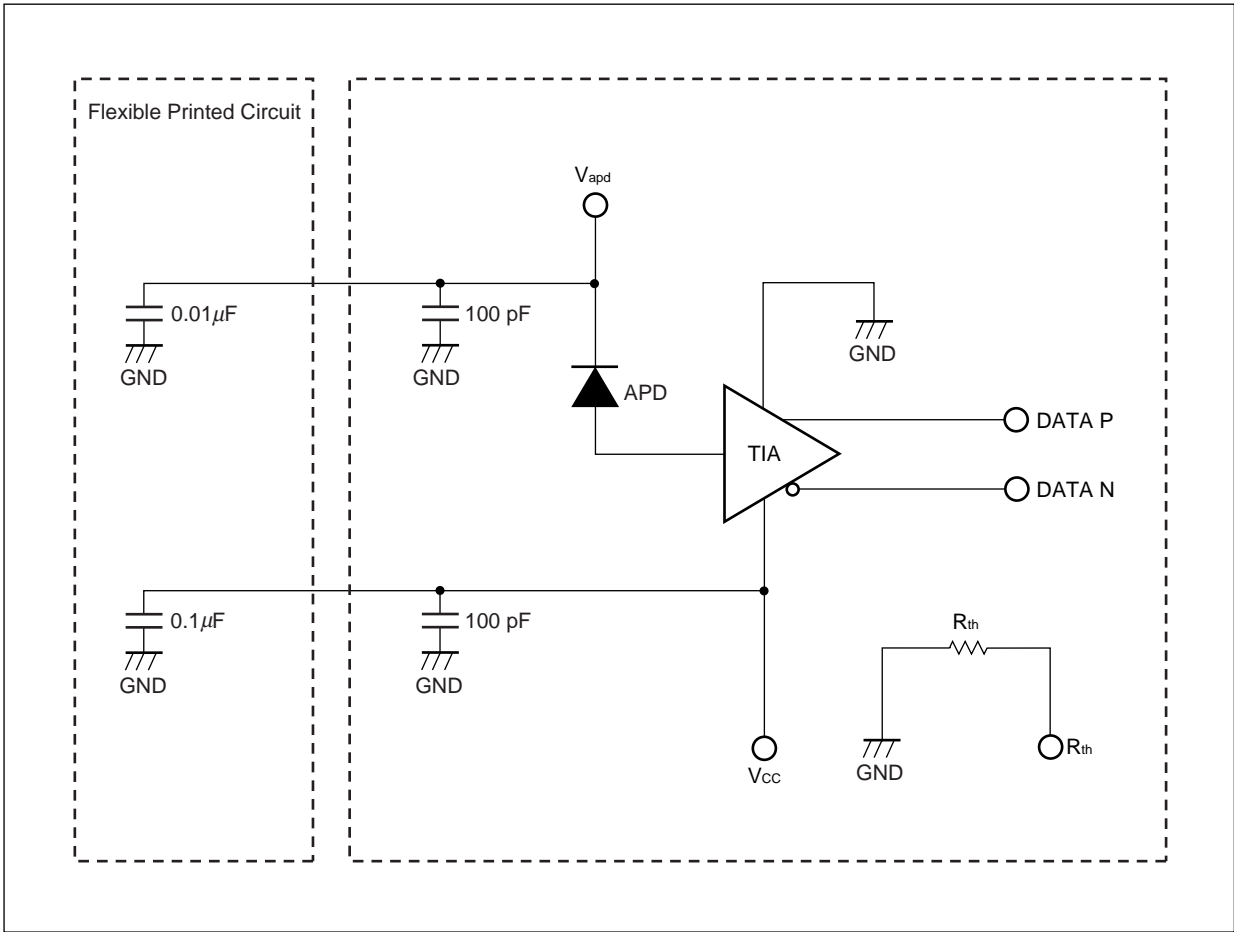








BLOCK DIAGRAM



ORDERING INFORMATION

Part Number	Receptacle Type	Flexible PCB Type
NR4210TF-AZ	SC, Zirconia	Standard
NR4210TG-AZ	LC, Electrically Isolated	Standard
NR4210TK-AZ	LC, Zirconia	Long
NR4210TL-AZ	LC, Electrically Isolated	Long
NR4210TP-AZ	LC, Zirconia	Standard
NR4210TX-AZ	SC, Metal	Standard

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Ratings	Unit
APD Reverse Voltage	V_R	V_{BR}	V
APD Reverse Current	$I_{R (peak)}$	4	mA
IC Supply Voltage	V_{CC}	0 to +4	V
Operating Case Temperature	T_C	-5 to +85	°C
Storage Temperature	T_{stg}	-40 to +85	°C
Lead Soldering Temperature (Flexible Printed Circuit)	T_{slid}	350 (3 sec.)	°C

ELECTRO-OPTICAL CHARACTERISTICS (T_c = -5 to +85°C, V_{cc} = +3.3 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 _{BR}	I _D = 10 μA	25	30	35	V
Temperature Coefficient of APD Breakdown Voltage	δ ^{*1}	T _C = +25 to +85°C	0	0.02	0.05	V/°C
APD Dark Current	I _D	V _R = V _{BR} × 0.9, T _C = +25°C			0.7	μA
Transimpedance	Z _t	Single-ended	800	2 000	3 000	Ω
Maximum Output Voltage Swing	V _{clip}	Single-ended	100	125	200	mV _{pp}
Cut-off Frequency	f _c	M = 3, P _{in} = -24 dBm		9		GHz
		M = 9, P _{in} = -24 dBm	7	8		
Lower Cut-off Frequency	f _{cl}				100	kHz
Peaking	D _{PK}	1G-BW, M = 9, P _{in} = -24 dBm			2	dB
Group Delay	GD	1G-6G, M = 9, P _{in} = -24 dBm	-50		+50	ps
Minimum Receiver Sensitivity	P _r	9.95 Gb/s, BER = 10 ⁻¹² , M _{opt} , PRBS = 2 ³¹ -1, ER = 13 dB, NRZ		-28	-26.5	dBm
Overload	P _O	9.95 Gb/s, BER = 10 ⁻¹² , M = 3, PRBS = 2 ³¹ -1, ER = 13 dB, NRZ	-5			dBm
RF Output Return Loss	S ₂₂	1G-6G, M = 9, Single-ended			-6	dB
IC Supply Current	I _{cc}		40	55	75	mA
IC Supply Voltage	V _{cc}		+3.1	+3.3	+3.5	V
Optical Return Loss	ORL	λ = 1 310 nm			-27	dB
		λ = 1 550 nm			-27	
Thermistor Resistance	R _{th}		9.5	10	10.5	kΩ
Thermistor B Constant	B		3 350	3 450	3 550	K

$$*1 \delta = \frac{\Delta V_{BR}}{\Delta T_c}$$

REFERENCE

Document Name	Document No.
Opto-Electronics Devices Pamphlet ^{*1}	PX10160E

*1 Published by the former NEC Compound Semiconductor Devices, Ltd.

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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.

► For further information, please contact

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Subject: Compliance with EU Directives

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Restricted Substance per RoHS	Concentration Limit per RoHS (values are not yet fixed)	Concentration contained in CEL devices	
		-A	-AZ
Lead (Pb)	< 1000 PPM	Not Detected	(*)
Mercury	< 1000 PPM	Not Detected	
Cadmium	< 100 PPM	Not Detected	
Hexavalent Chromium	< 1000 PPM	Not Detected	
PBB	< 1000 PPM	Not Detected	
PBDE	< 1000 PPM	Not Detected	

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