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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.

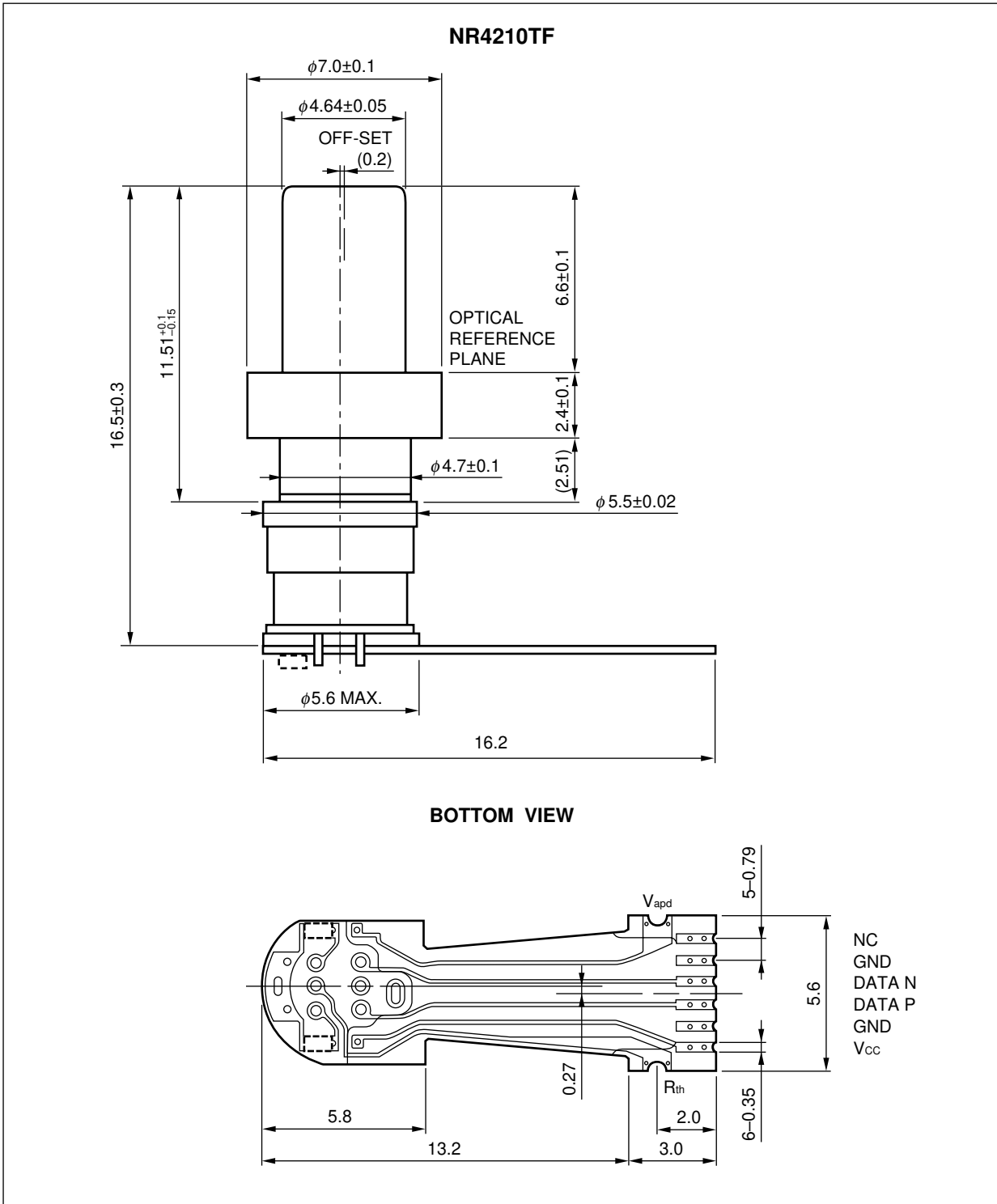
FEATURES

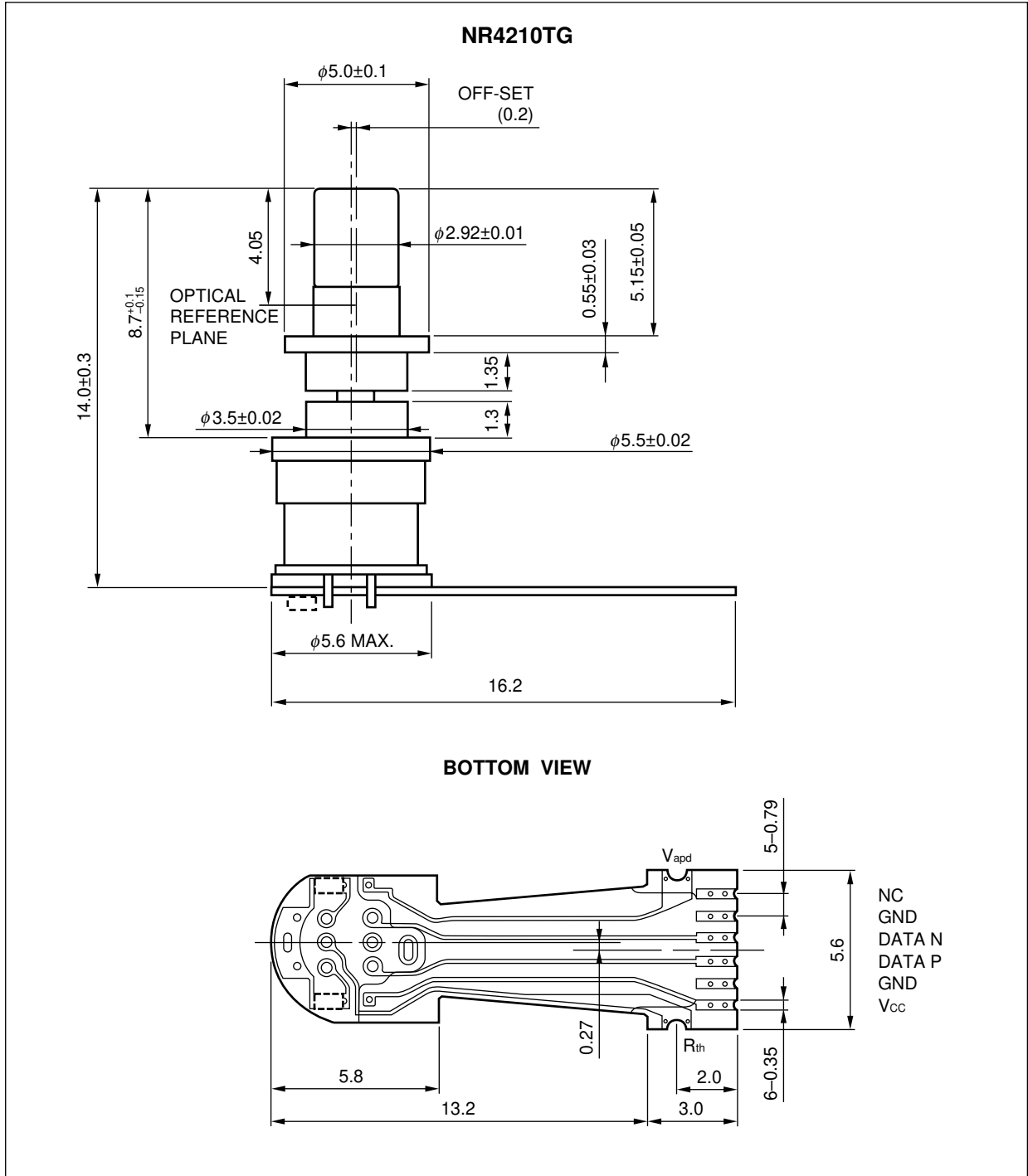
- XMD-MSA compliant ROSA
- 10 Gb/s high sensitivity InAIAs-APD
- +3.3 V SiGe transimpedance pre-amplifier
- Minimum receiver sensitivity $\bar{P}_r = -28$ dBm
- Operating case temperature $T_c = -5$ to $+85^\circ\text{C}$
- Transimpedance $Z_t = 2\ 000\ \Omega$ (Single-ended)
- Cut-off frequency $f_c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

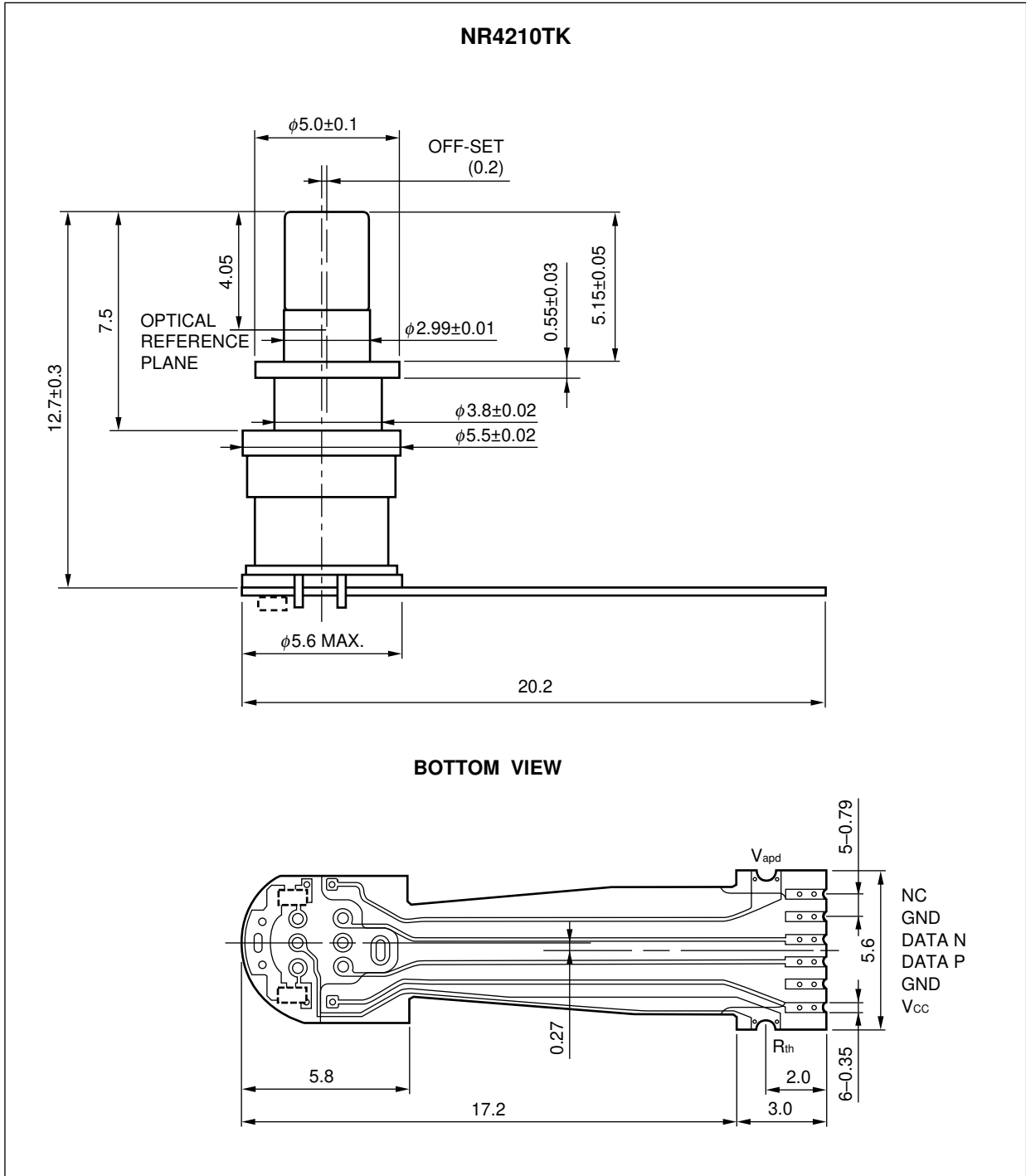


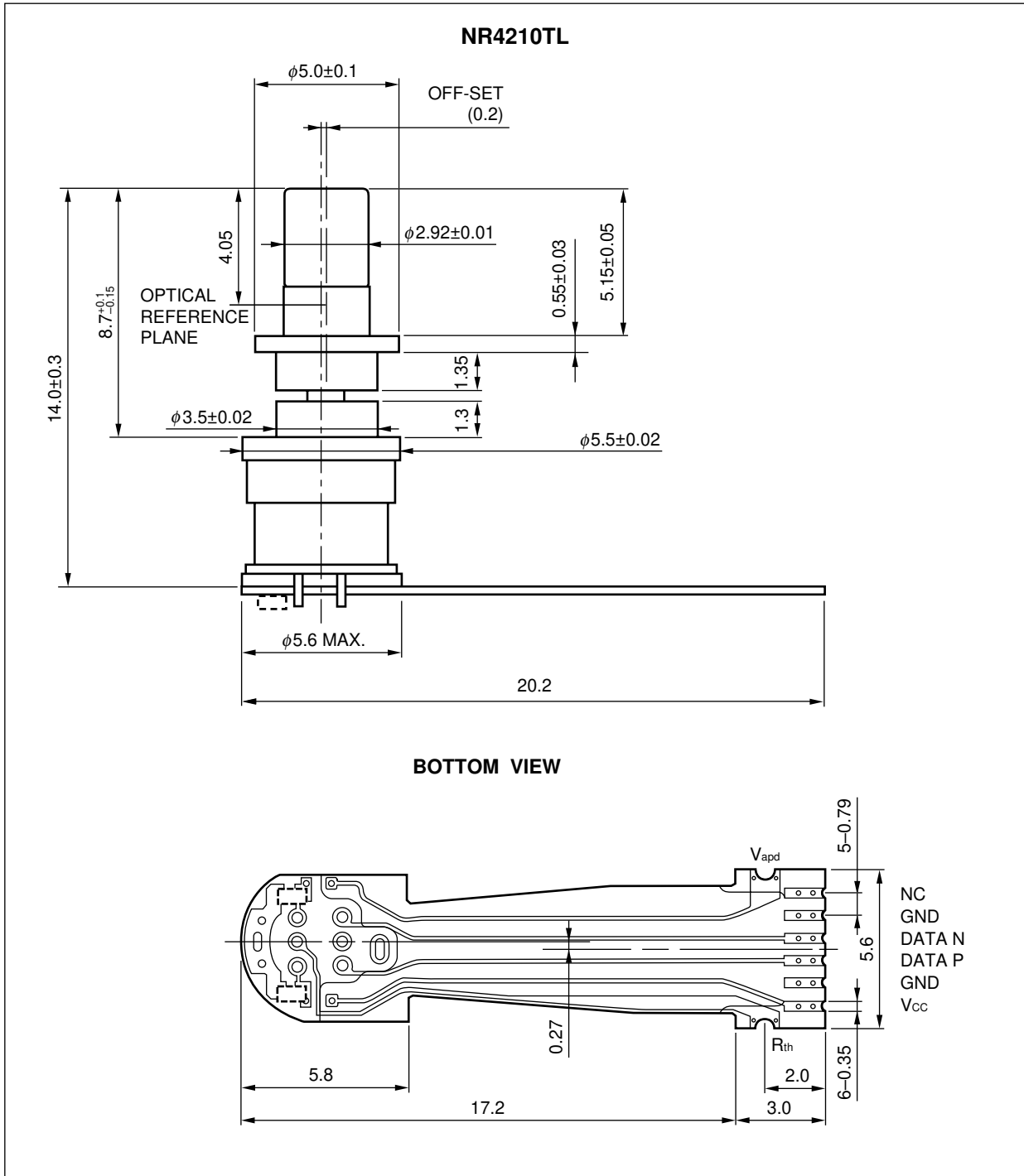
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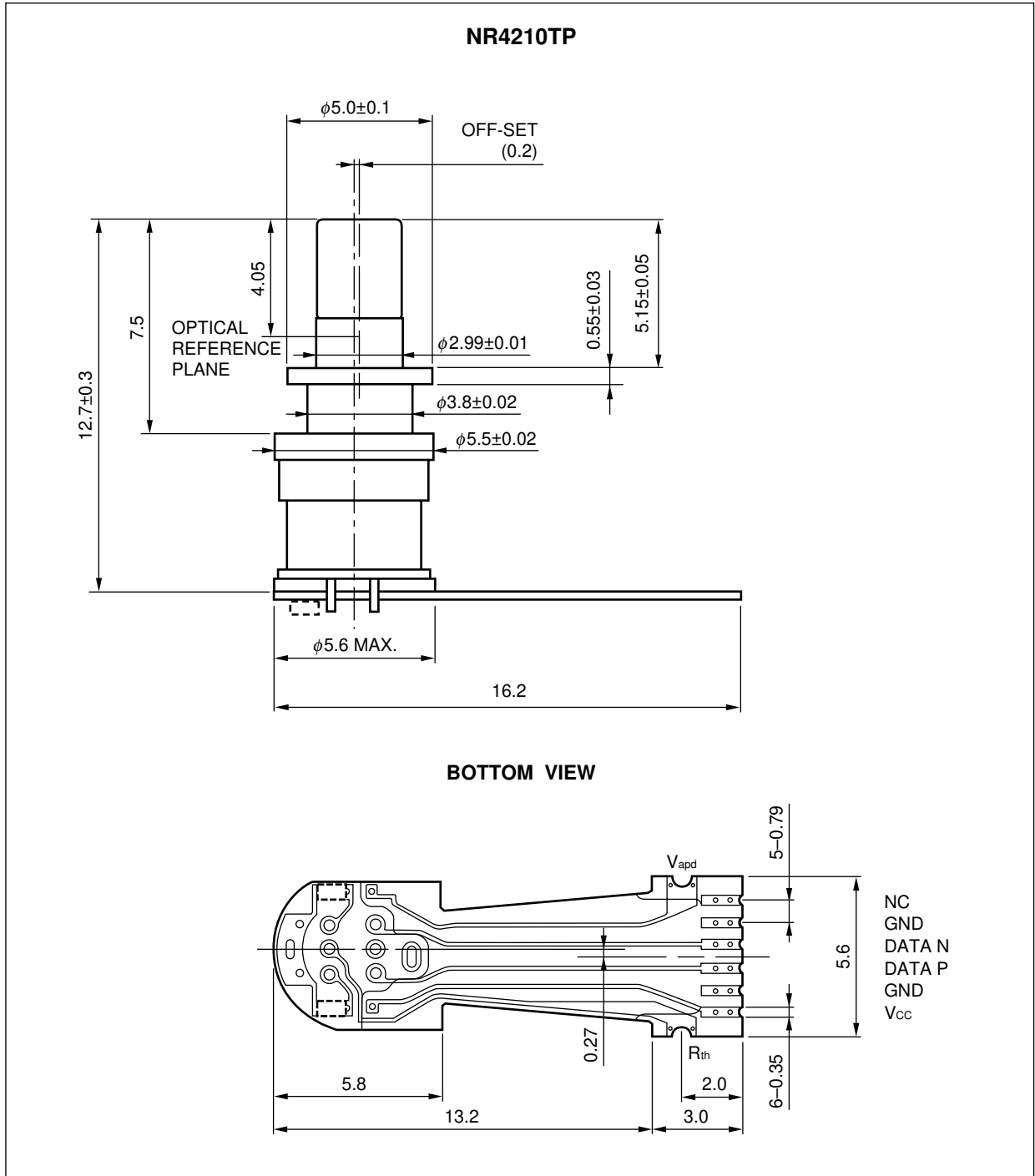
PACKAGE DIMENSIONS (UNIT: mm)

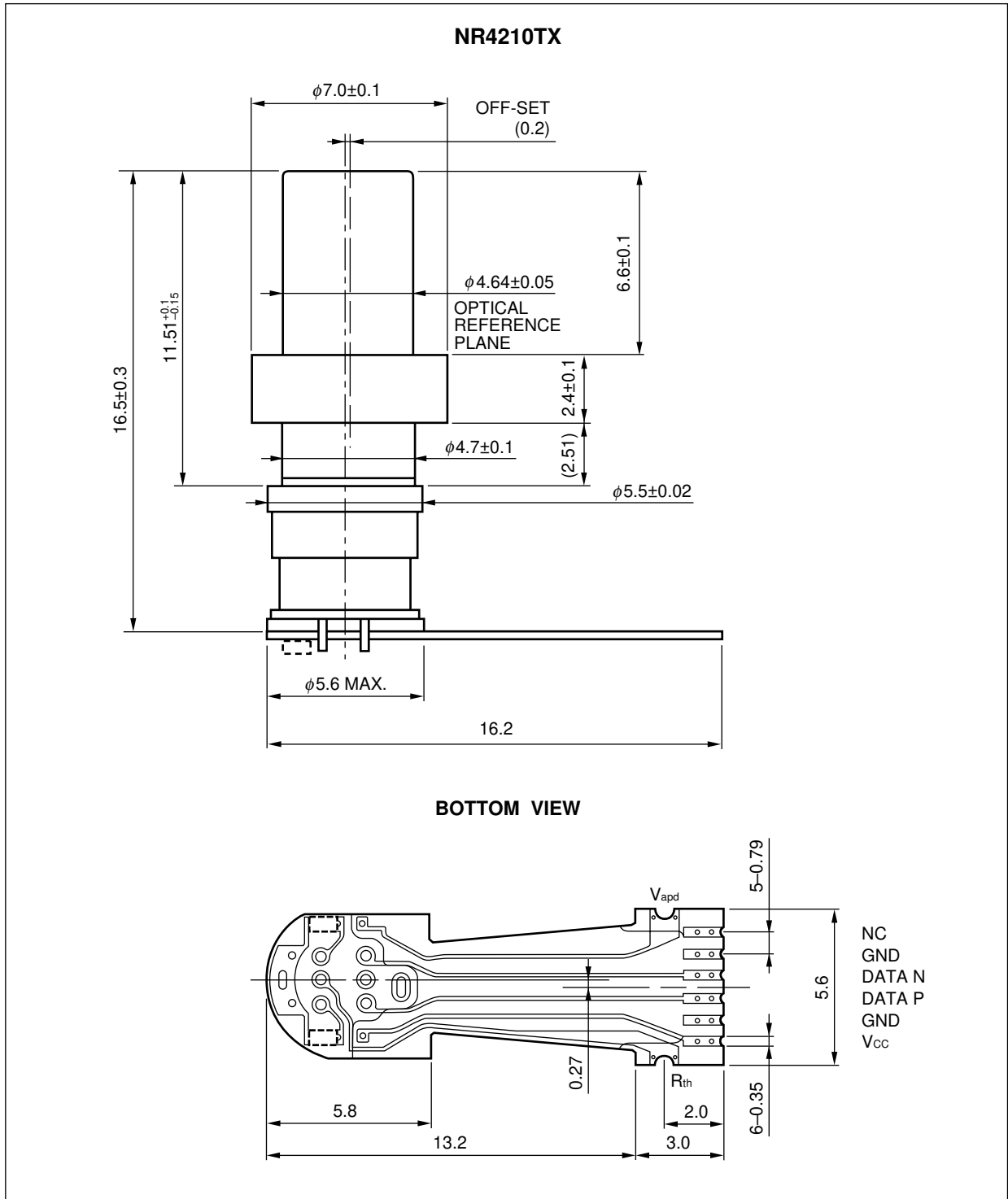




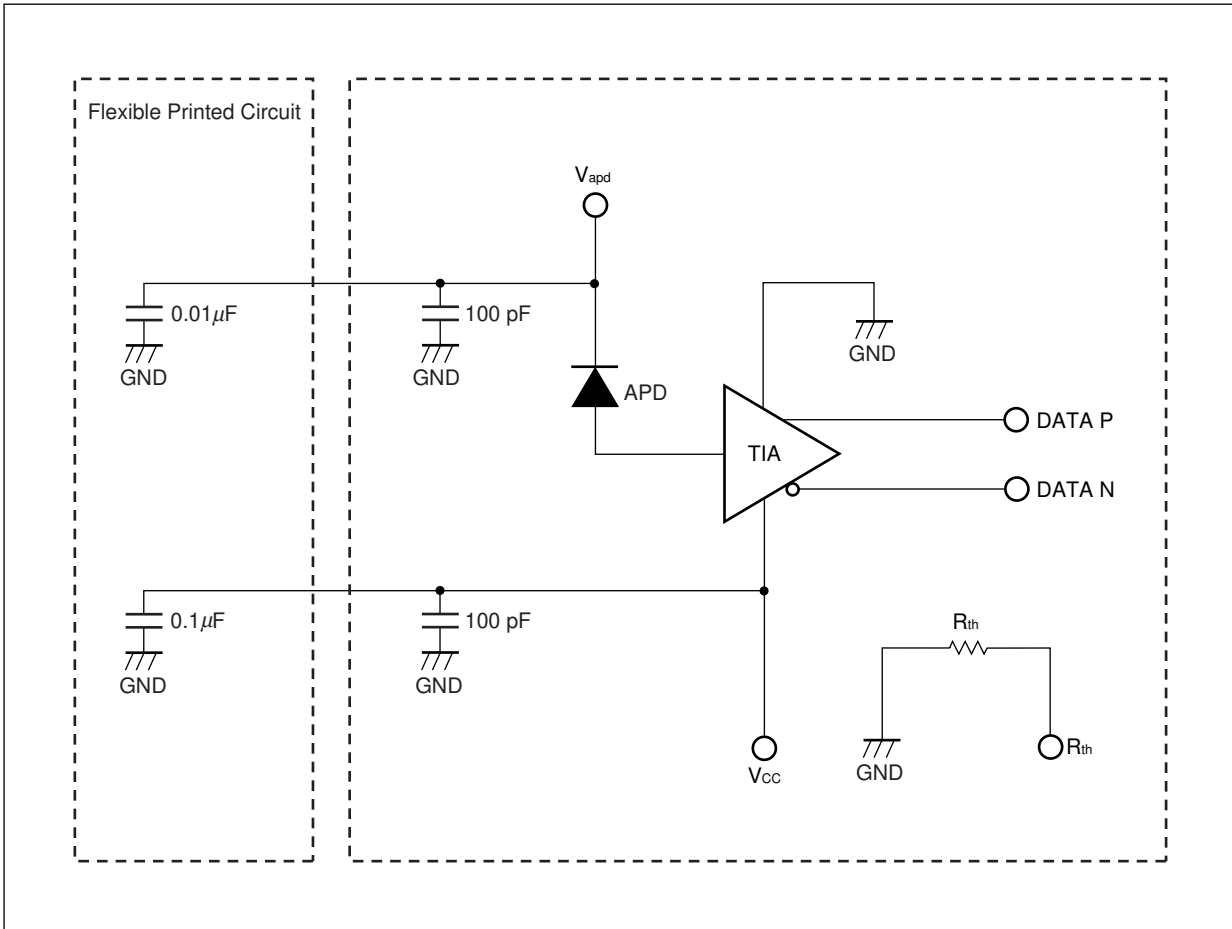








BLOCK DIAGRAM



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_{sld}	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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CEL Pb-free products have the same base part number with a suffix added. The suffix –A indicates that the device is Pb-free. The –AZ suffix is used to designate devices containing Pb which are exempted from the requirement of RoHS directive (*). In all cases the devices have Pb-free terminals. All devices with these suffixes meet the requirements of the RoHS directive.

This status is based on CEL’s understanding of the EU Directives and knowledge of the materials that go into its products as of the date of disclosure of this information.

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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