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CEL (California Eastern Laboratories)
NR4210TA-EC-AZ

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PRELIMINARY DATA SHEET

CEL

RECEIVER

NR4210 Series

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

DESCRIPTION

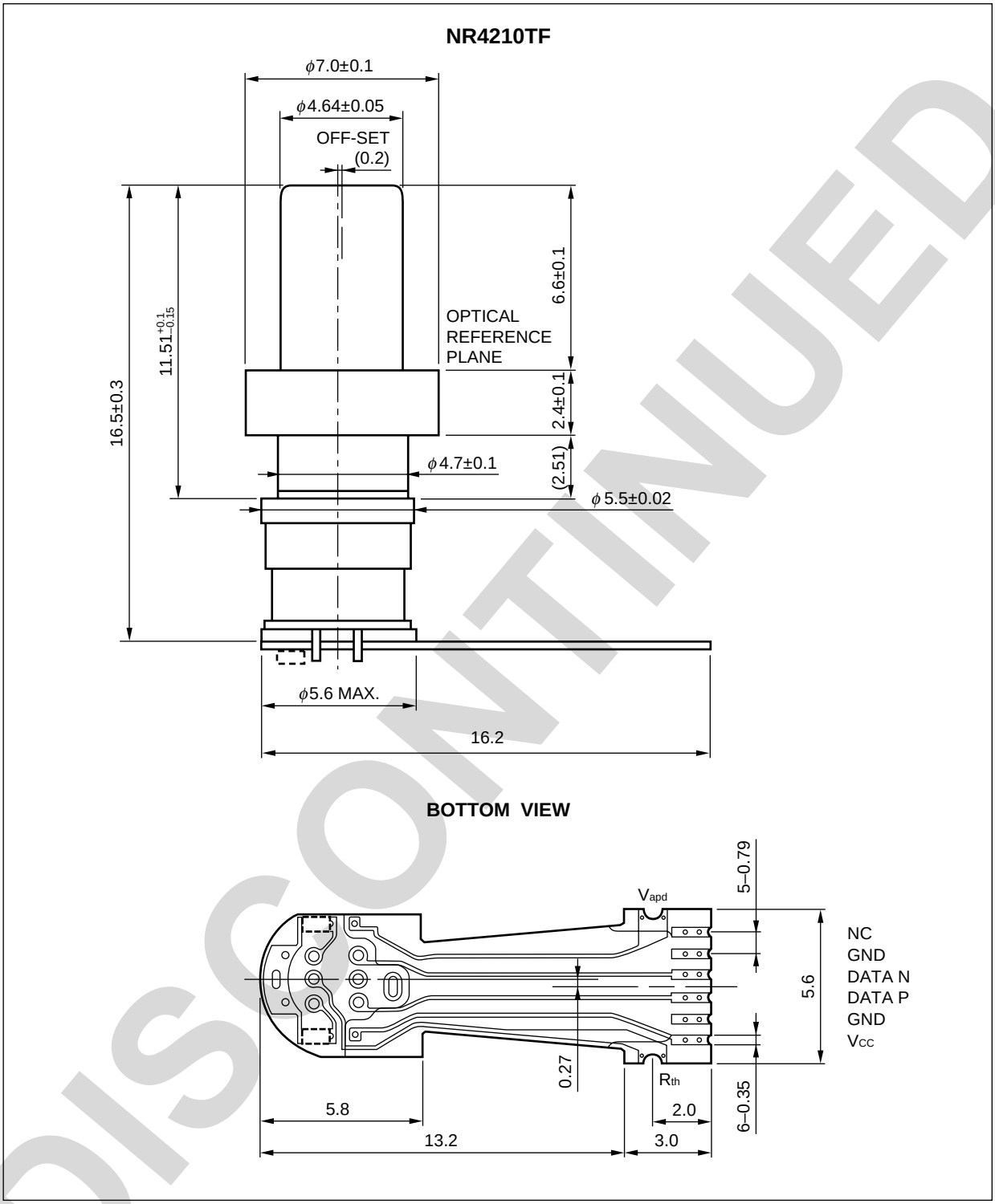
The NR4210 Series products consist of InAlAs-APD (avalanche photo diode) ROSAs (Receiver Optical Sub-Assembly) with internal pre-amplifiers designed for 10 Gb/s long-reach optical transceivers such as the XENPAK/X2/XFP. These modules are ideal as receivers for IEEE 10G BASE and SONET OC-192 systems.

FEATURES

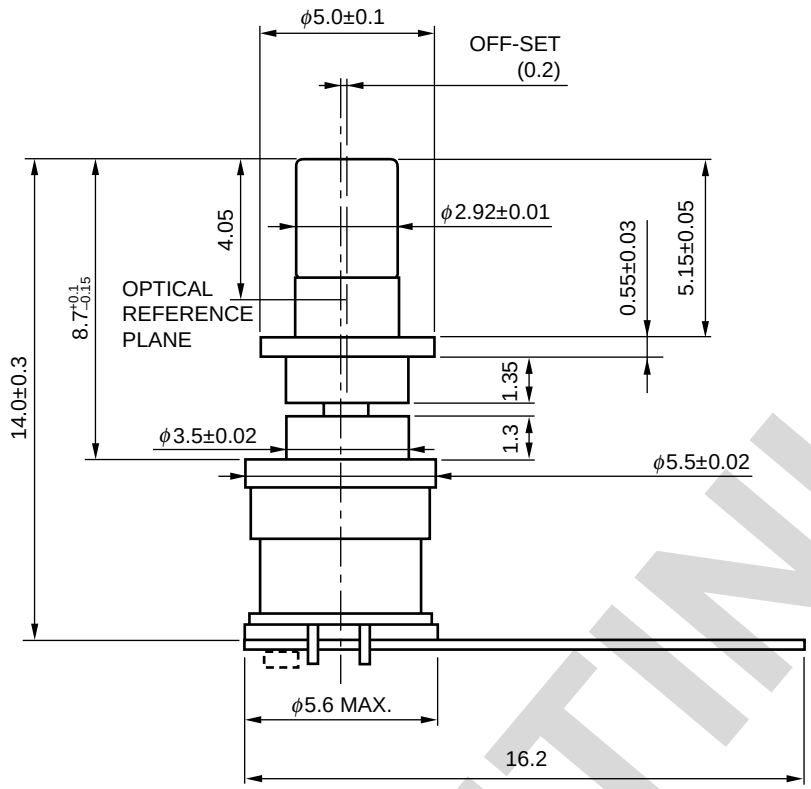
- XMD-MSA compliant ROSA
- 10 Gb/s high sensitivity InAlAs-APD
- +3.3 V SiGe transimpedance pre-amplifier
- Minimum receiver sensitivity $\overline{P_r}$ = –28 dBm
- Operating case temperature T_C = –5 to +85°C
- Transimpedance Z_t = 2 000 Ω (Single-ended)
- Cut-off frequency fc = 8 GHz
- With flexible printed circuit

Document No. PL10637EJ01V0DS (1st edition)
Date Published September 2006 NS CP(K)

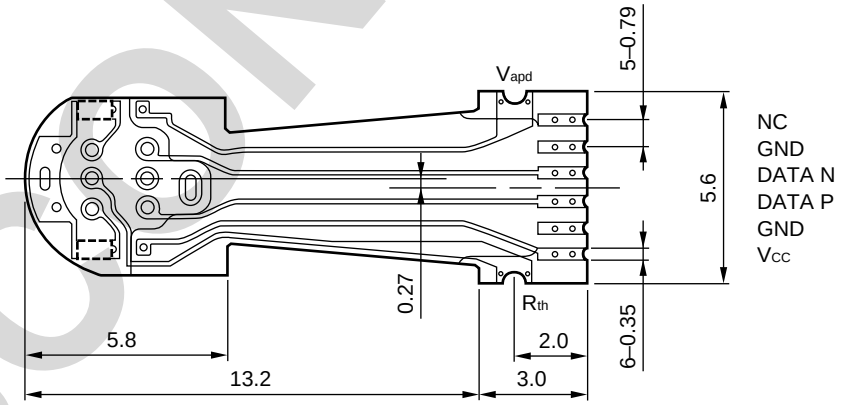
PACKAGE DIMENSIONS (UNIT: mm)



NR4210TG



BOTTOM VIEW



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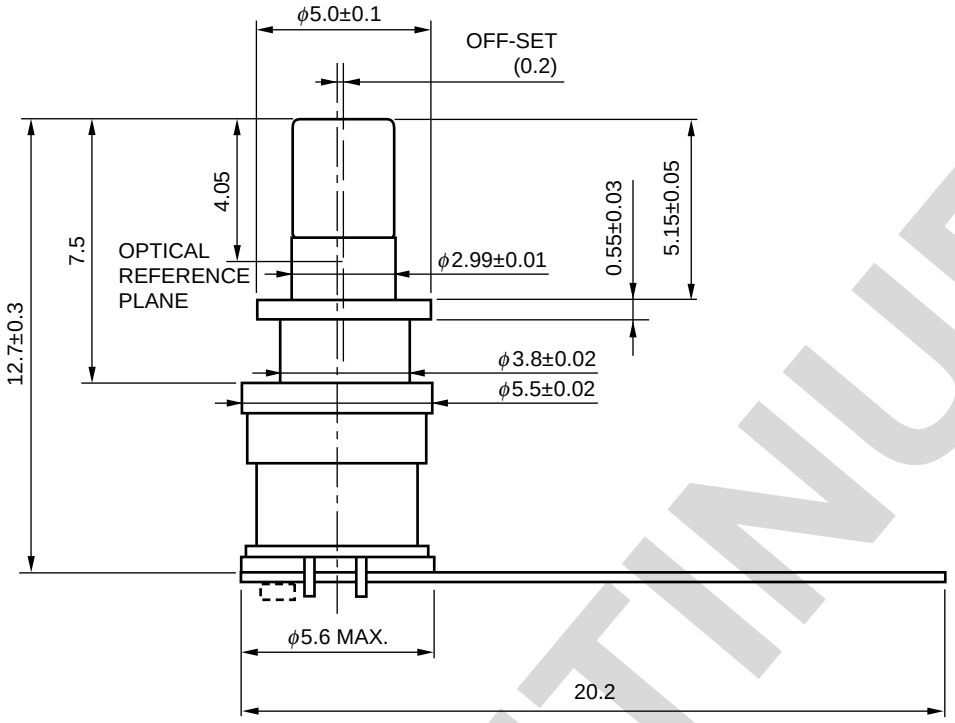

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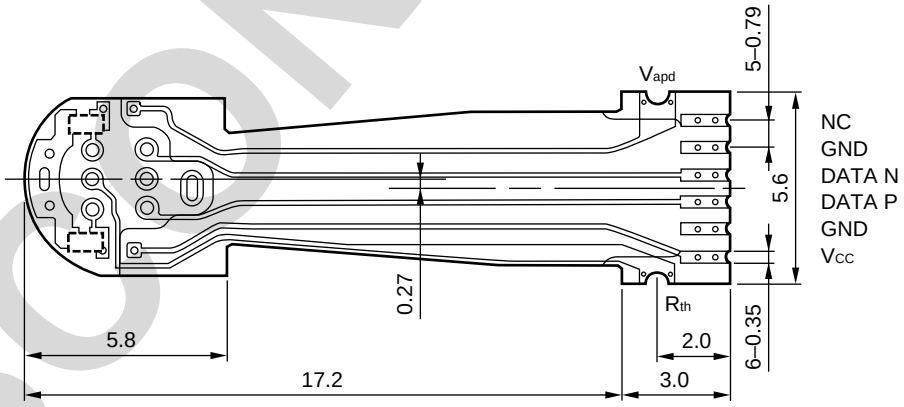

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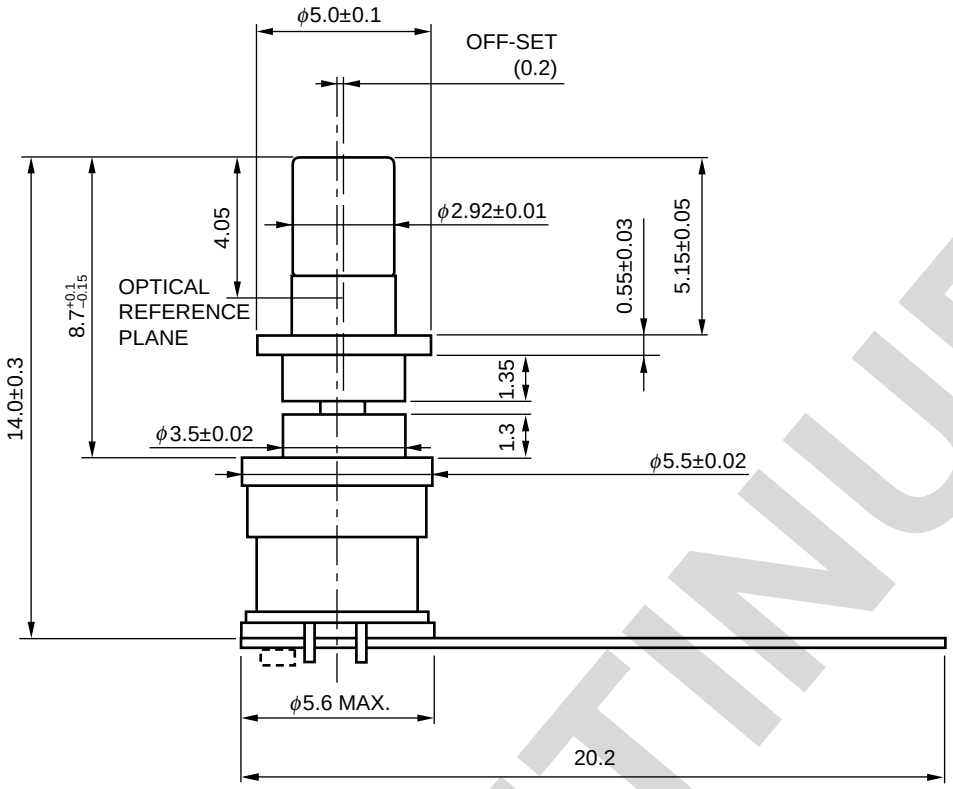

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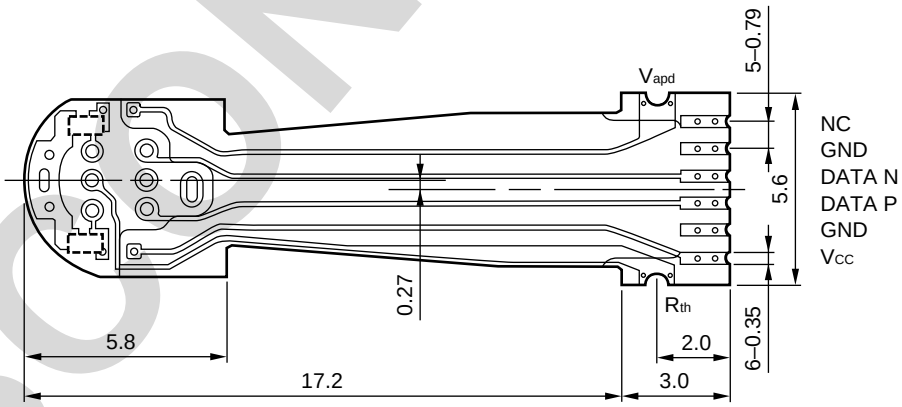
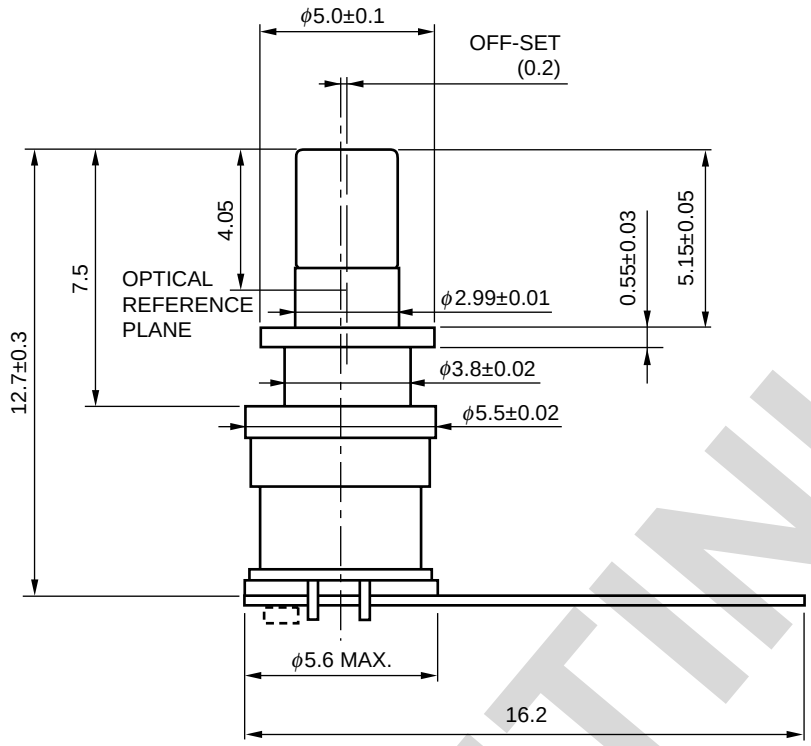


NR4210TP



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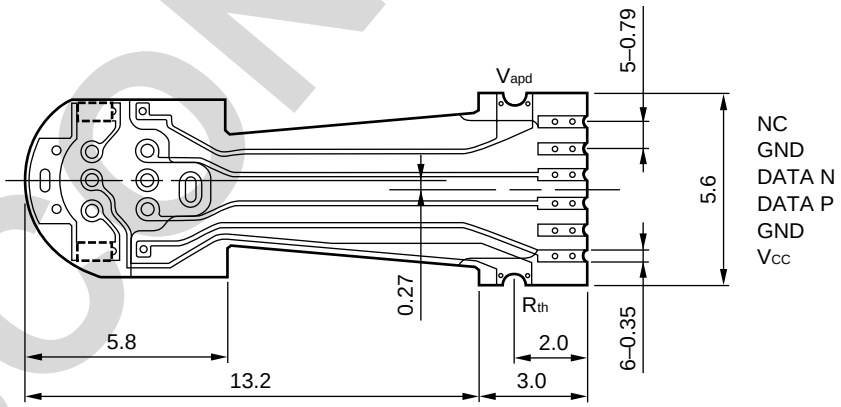
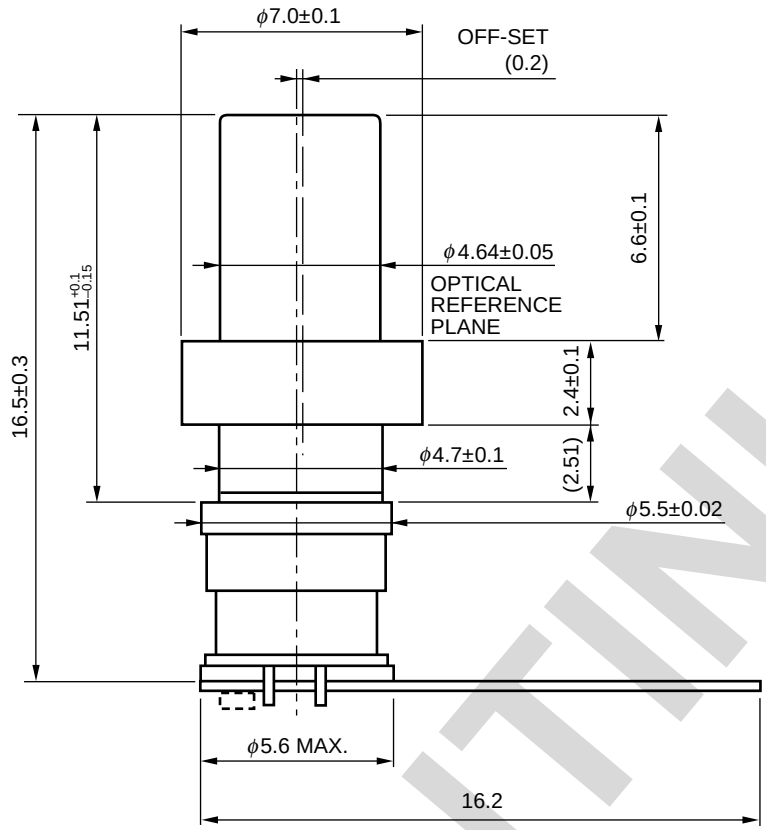


NR4210TX



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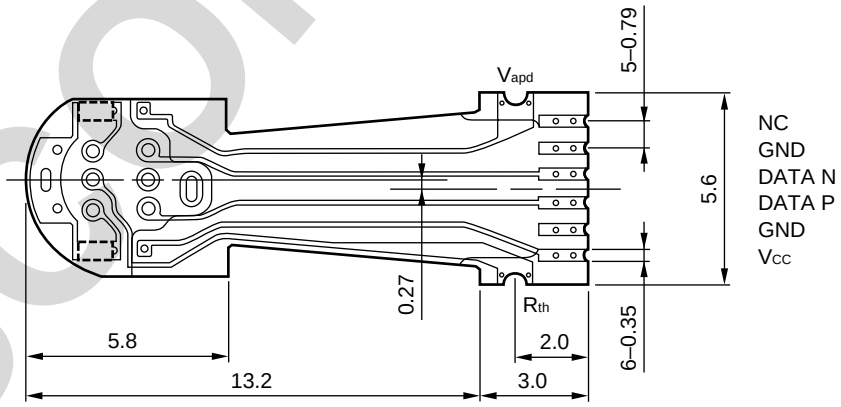
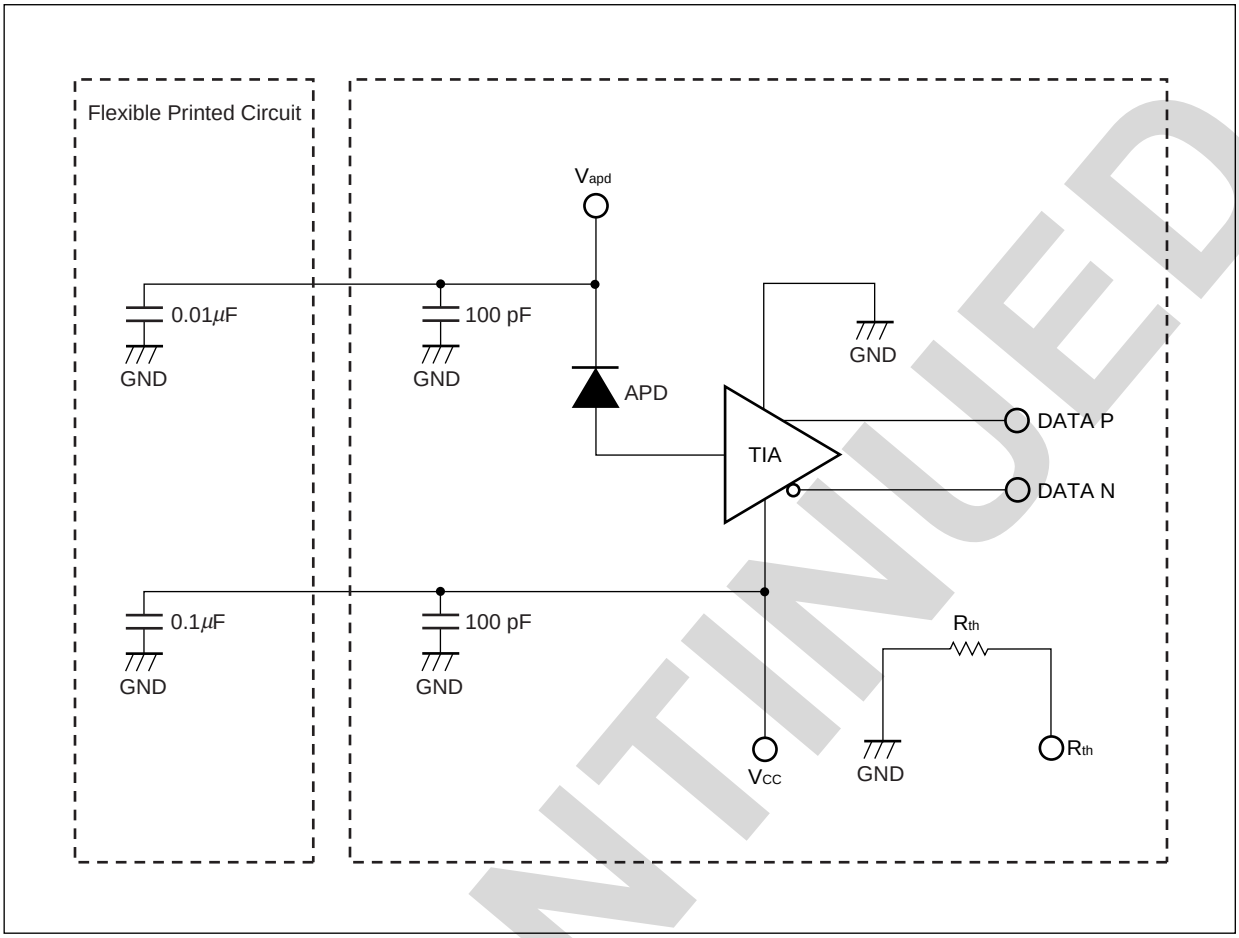


BLOCK DIAGRAM



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	$V_R = V_{BR} \times 0.9$, 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	fcl				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	$\overline{P_r}$	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** $\delta = \dfrac{\Delta V_{BR}}{\Delta T_C}$

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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Caution Optical Fiber	A glass-fiber is attached on the product. Handle with care. • When the fiber is broken or damaged, handle carefully to avoid injury from the damaged part or fragments.

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Subject: Compliance with EU Directives

CEL certifies, to its knowledge, that semiconductor and laser products detailed below are compliant with the requirements of European Union (EU) Directive 2002/95/EC Restriction on Use of Hazardous Substances in electrical and electronic equipment (RoHS) and the requirements of EU Directive 2003/11/EC Restriction on Penta and Octa BDE.

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	
Lead (Pb)	< 1000 PPM	-A	-AZ
		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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