

**InGaAs PIN-PD RECEIVER WITH INTERNAL PRE-AMPLIFIER  
FOR 10 Gb/s APPLICATIONS****DESCRIPTION**

The NR3313TQ products consist of InGaAs PIN ROSAs (Receiver Optical Sub-Assembly) with internal pre-amplifiers designed for 10 Gb/s optical transceivers such as the XFP/SFP+. These modules are ideal as receivers for IEEE 10G BASE and SONET OC-192 systems.

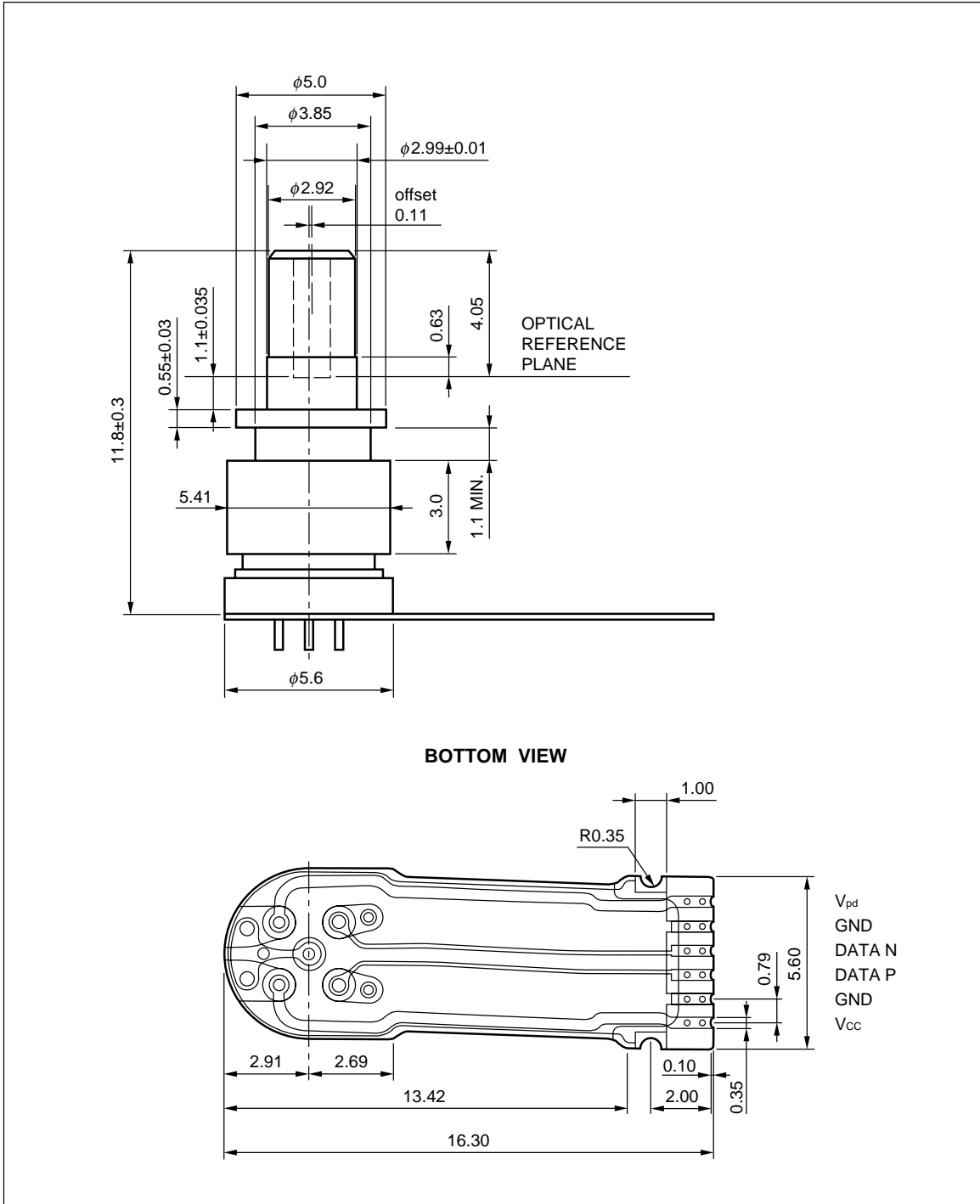
**FEATURES**

- XMD-MSA compliant ROSA
- 10 Gb/s high sensitivity InGaAs PIN-PD
- +3.3 V transimpedance pre-amplifier
- Minimum receiver sensitivity  $\bar{P}_r = -20$  dBm
- Operating case temperature  $T_c = -20$  to  $+95^\circ\text{C}$
- Transimpedance  $Z_t = 6\,000\ \Omega$  (Single-ended)
- Cut-off frequency  $f_c = 8.5$  GHz
- With flexible printed circuit

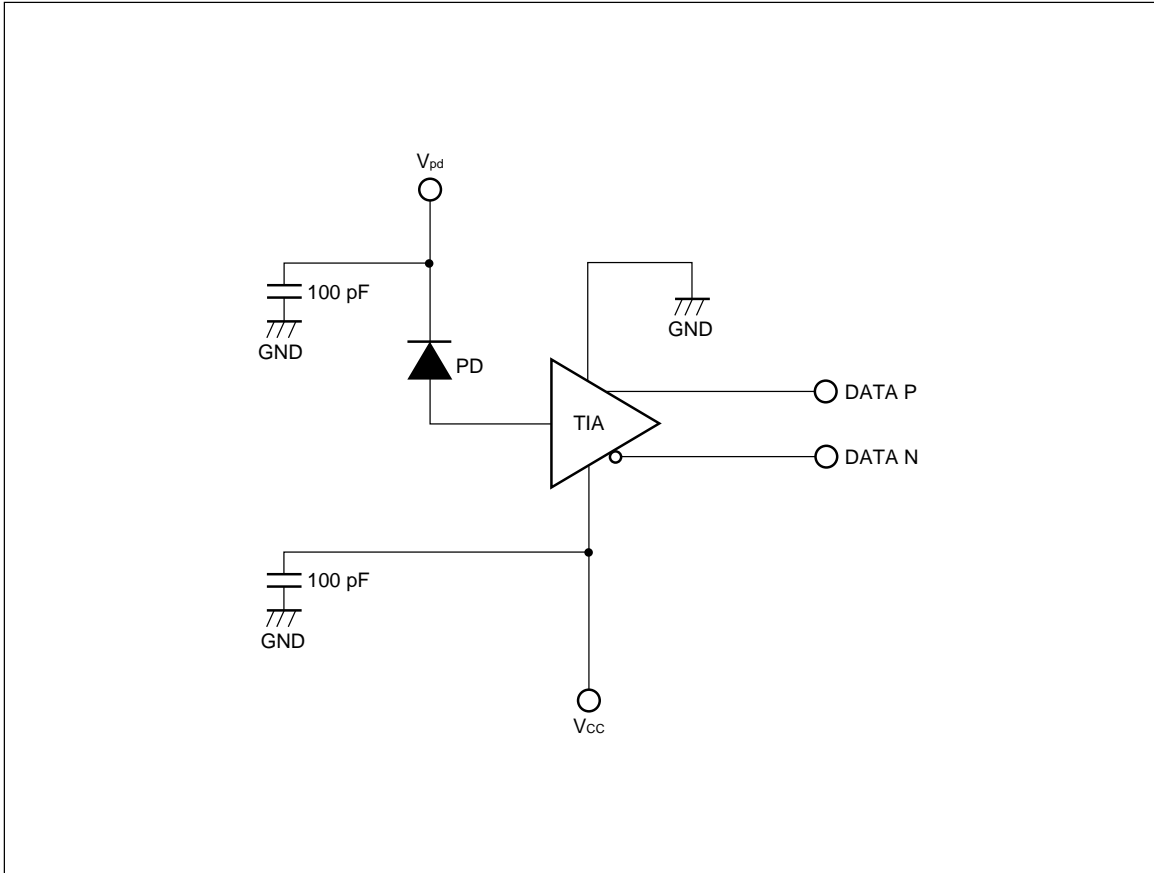


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PACKAGE DIMENSIONS (UNIT: mm)



**BLOCK DIAGRAM**



**ORDERING INFORMATION**

Part Number	Receptacle Type	Note
NR3313TQ	LC, Isolated	Differential output with flexible PCB

**ABSOLUTE MAXIMUM RATINGS**

Parameter	Symbol	Ratings	Unit
PIN-PD Reverse Voltage	$V_R$	10	V
PIN-PD Reverse Current	$I_R$	10	mA
IC Supply Voltage	$V_{CC}$	-0.3 to +4	V
Operating Case Temperature	$T_C$	-20 to +95	°C
Storage Temperature	$T_{stg}$	-40 to +85	°C
Maximum AOP Input (ER < 5.4 dB (1.1 A/W))	$P_{in}$	+5	dBm
Lead Soldering Temperature (Flexible Printed Circuit)	$T_{slid}$	260 (10 sec.)	°C

**RECOMMENDED OPERATING CONDITION**

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
PIN-PD Reverse Voltage	$V_R$	2.8	3.3	3.5	V
IC Supply Voltage	$V_{CC}$	+2.97	+3.3	+3.5	V
Operating Case Temperature	$T_C$	-20	+25	+95	°C

**ELECTRO-OPTICAL CHARACTERISTICS ( $\lambda = 1\ 310\ \text{nm}/1\ 550\ \text{nm}$ , unless otherwise specified)**

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Sensitivity	S		0.75		1.2	A/W
Transimpedance	$Z_t$	$R_L = 50\ \Omega$ , $P_{in} = -20\ \text{dBm}$ , Single-ended	3 000	6 000	10 000	$\Omega$
Maximum Output Voltage Swing	$V_{clip}$	Single-ended			350	$\text{mV}_{pp}$
Cut-off Frequency	$f_c$	$R_L = 50\ \Omega$ , $P_{in} = -17\ \text{dBm}$ , -3 dB from 1 GHz	6.5	8.5		GHz
Minimum Receiver Sensitivity	$\bar{P}_r$	9.95 Gb/s, BER = $10^{-12}$ ,		-20	-17	dBm
Overload	$P_O$	PRBS = $2^{31}-1$ , ER > 10 dB, NRZ, $\lambda = 1\ 550\ \text{nm}$	+1	+3		dBm
IC Supply Current	$I_{CC}$	$V_{CC} = 3.5\ \text{V}$			50	mA
Optical Return Loss	ORL				-27	dB

**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><b>Caution</b></p>	<p>GaAs Products</p>	<p>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.</p> <ul style="list-style-type: none"> <li>• 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.             <ol style="list-style-type: none"> <li>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.</li> <li>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.</li> </ol> </li> <li>• Do not burn, destroy, cut, crush, or chemically dissolve the product.</li> <li>• Do not lick the product or in any way allow it to enter the mouth.</li> </ul>
<p><b>Caution</b></p>	<p>Optical Fiber</p>	<p>A glass-fiber is attached on the product. Handle with care.</p> <ul style="list-style-type: none"> <li>• When the fiber is broken or damaged, handle carefully to avoid injury from the damaged part or fragments.</li> </ul>