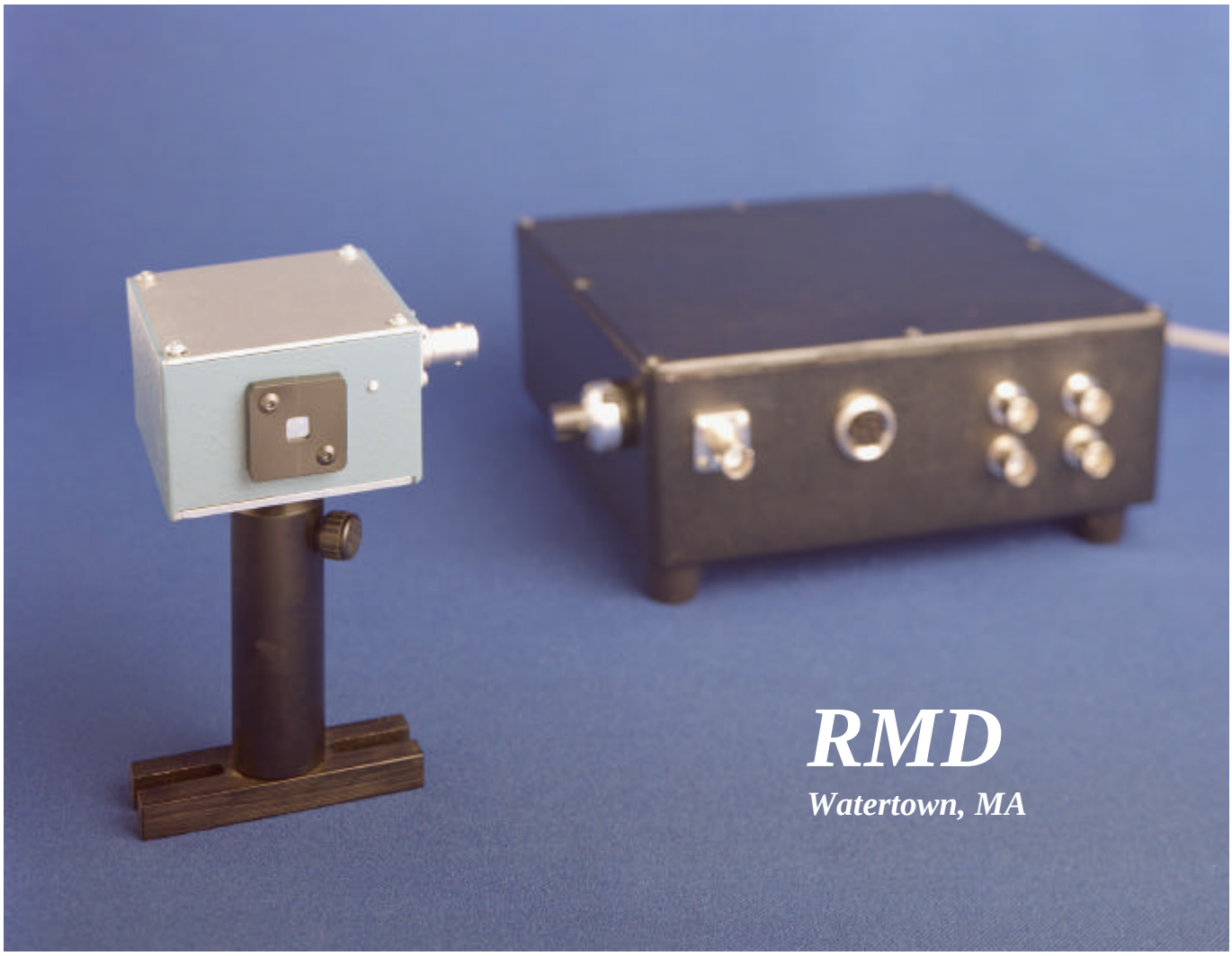
12 MHz Quadrant Avalanche Photodiode Module



RMD introduces the first stand-alone Quadrant Array Avalanche Photodiode (APD) Module. The wall-plug system provides a voltage output from 4-discrete APD elements ready for your data acquisition instrument. No additional electronics or pulse amplification is required for most applications.

Features

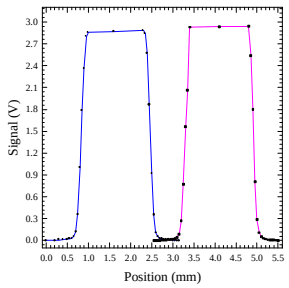
- 2 x 2 array of 4 mm^2 APD pixels
- 4 independent voltage output signals with a 12 MHz bandwidth
- Signal gain > 5000
- Quantum Efficiency near 80% between 830 – 905 nm
- Detector module and power supply module are physically separate
- Variable bias control
- Wall-plug operation

Applications

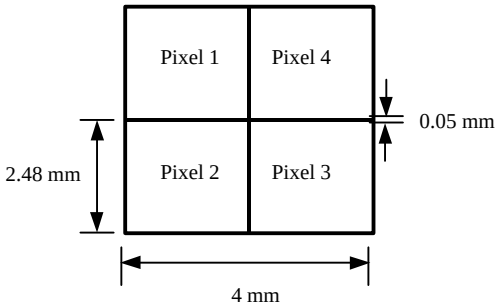
- Position Sensing
- Target Tracking
- Laser Ranging
- Fluorescence Spectroscopy
- Scintillation Detection, Nuclear Imaging, and Tritium Detection

With quantum efficiencies as high as 80% in the red and near-infrared wavelengths, these modules are excellent replacements for photomultiplier tubes. Quadrant array modules are available with a standard 2 x 2 format of 4 mm^2 APD elements; custom tailored modules to meet your needs are also available.

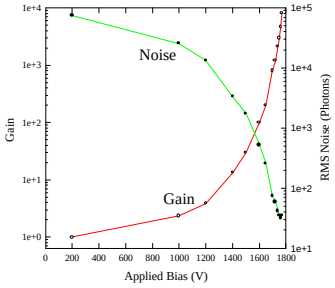
Response Across Two Pixels, Gain = 2000



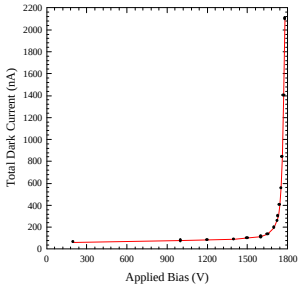
Layout of Quadrant Array



Pixel Gain and Noise vs. Applied Bias



Total Dark Current at 19 °C



Electrical	Optical	Mechanical
Bias voltage range 0 – 2000 V	Output pulse rise time 80 ns	Array format 2 x 2 APD elements, 2.48 mm pitch
Maximum gain > 4000	Output bandwidth 12 MHz	Single pixel active area 4 mm^2
Input noise/pixel (at 2 MHz) 30 photons RMS	Quantum efficiency (830 nm – 905 nm) near 80%	Total active area 16 mm^2
Total dark current at 19 °C 500 nA	Crosstalk 5%	
Capacitance 0.7 pf/mm		

Maximum Rating	Power Unit	Detector Head
Power dissipation 0.1 W	AC input 100/120/220/240 VAC, 50/60 Hz	Input/output connector 7-pin multi-conductor
Operating temp. -55 to 40 °C	Output connector BNC Coaxial	HV input BNC
Bias voltage 1850 V	Size and weight 5 lbs., 7.4” x 7.4” x 2.5”	Size and weight 1 lbs., 3” x 2.63” x 1.65”

The typical electrical, optical and mechanical characteristics are given above for 2 x 2 quadrant arrays with 4 mm^2 APD elements @ 22 °C and 1750 V bias, unless otherwise noted. Caution: The operating voltages of up to 1850 volts supplied by this module may present a shock hazard. RMD's avalanche photodiode arrays are also described in RMD’s product sheet Silicon Avalanche Photodiode.

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