

Multi-Channel LuAG-APD Pixel Array with ToT Readout System

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A 144-channel Pr:LuAG-APD detector is designed and fabricated for medical application. The pixel of the crystal is 2mm x 2mm x 10mm and individually coupled with UV-enhanced 12 x 12 Avalanche Photo Diode array. The APD's pixels are individually connected with Time over Threshold based ASIC and sent to DAQ FPGA. ToT-ASIC is fabricated with 0.25um TSMC CMOS and the power dissipation is 230mW/board. FPGA is programmed to calibrate individual thresholds and digital multiplexing. The measured timing resolution is 4ns/module and transmission image is successfully acquired.

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