



CMOS X-ray Strip Detector Development at NSRRC

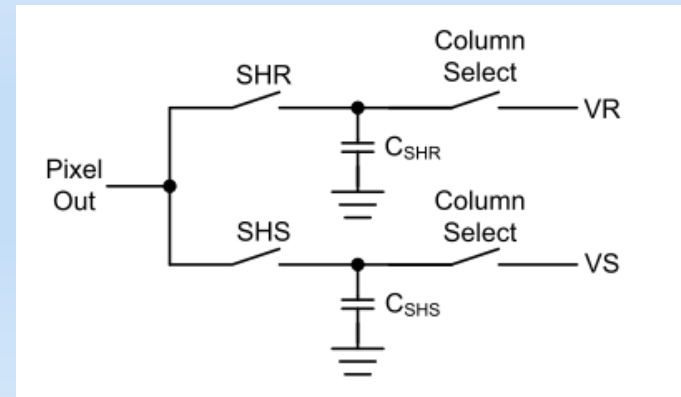
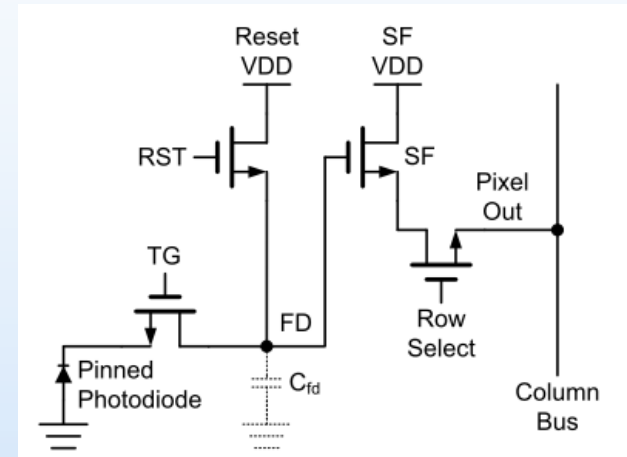
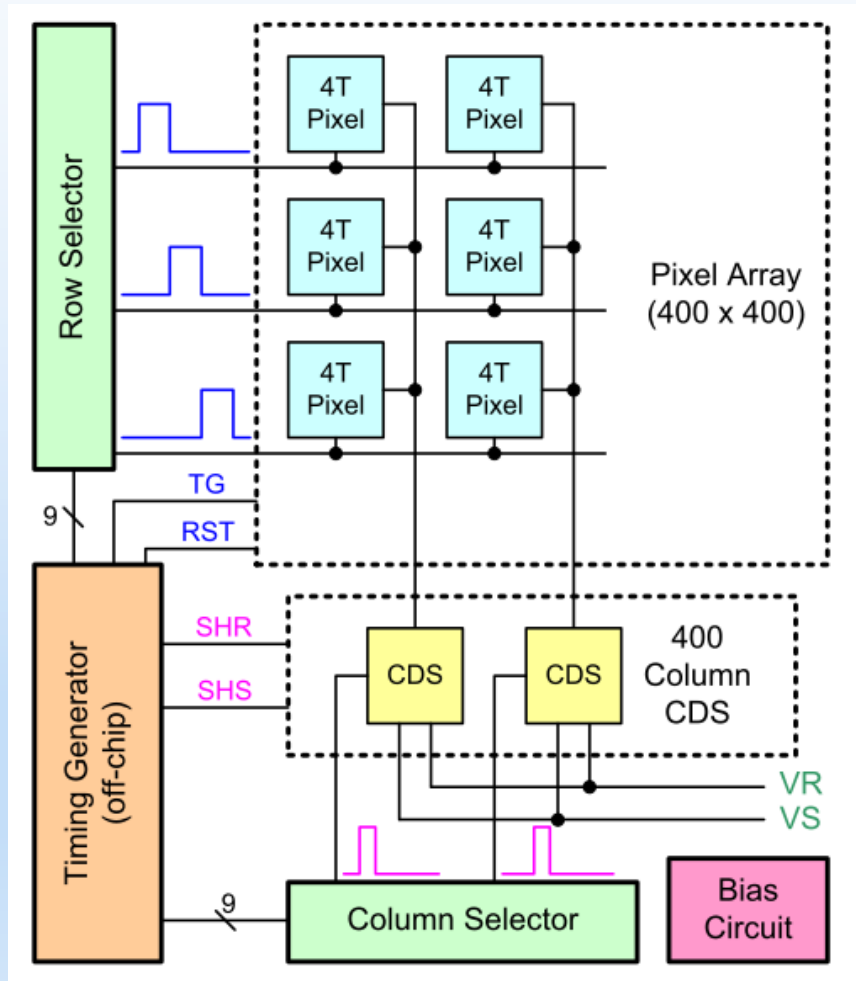
2021/02 NSRRC

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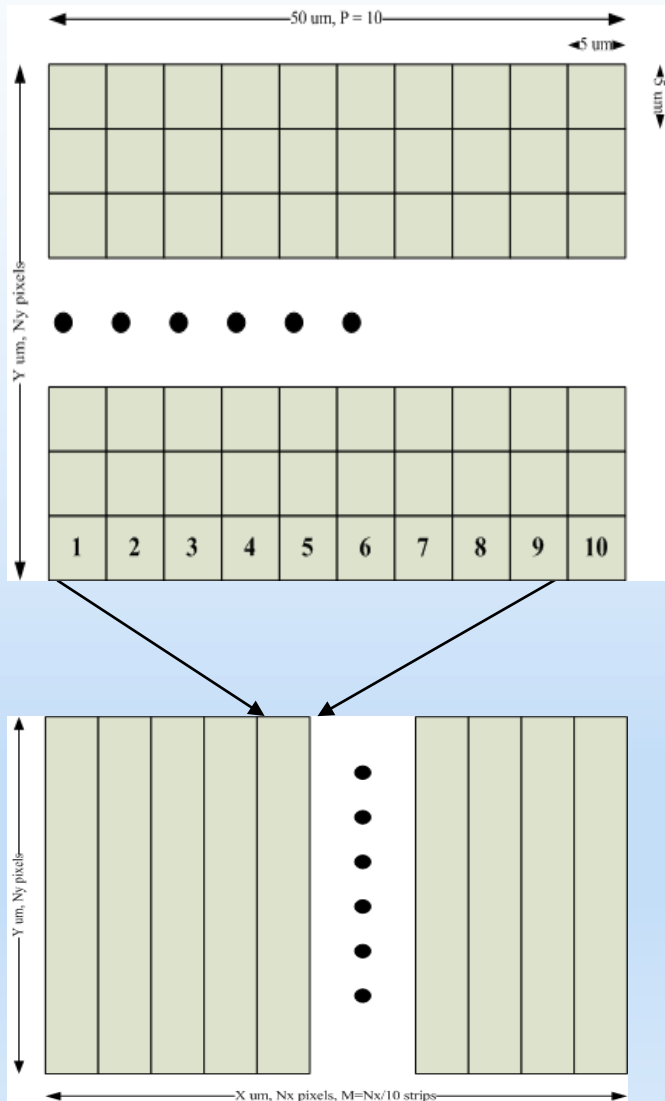
Project Summary

- The CMOS sensor prototype is designed by NSRRC cooperator and manufactured by foundry in Taiwan.
- Fiber optical plate and scintillation fusion with CMOS sensor will be done by Acuri Technology Co., Ltd in Taiwan.
- Readout circuit and software will be developed by NSRRC.
- The chip will be ready by Sep. this year. The final device will be tested at NSRRC by the end of this year.

CMOS Circuit Block Diagram



System Architecture

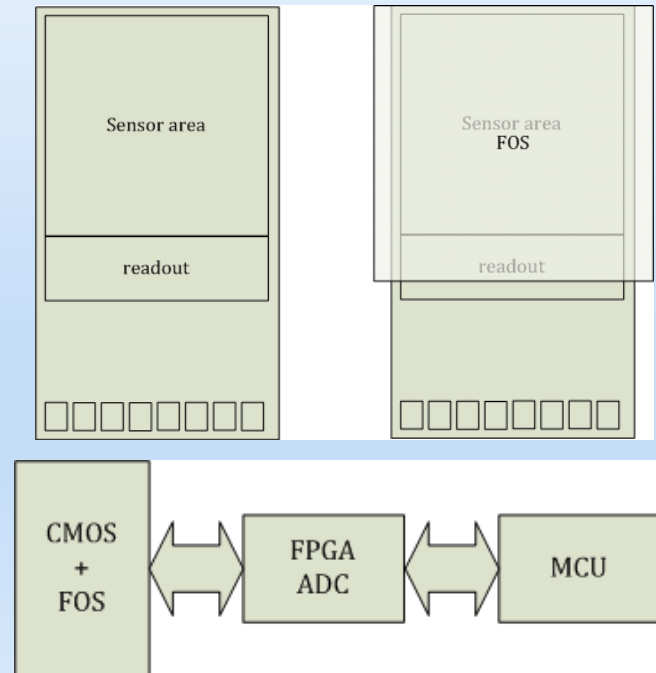


scintillator CsI:TI Crystal Structure

Features & Benefits

- High light output
- Emission wavelength at 550 nm
- Compatible with photodiode readout
- Maximum thickness to 400 μm

<http://www.acuri.com.tw>



Specification of Strip Detector

Energy range	10 - 50 keV
X-ray conversion	Scintillator + Fiber Optical Plate (FOP)
Pixel size	5 x 5 μm
FOP	Gadox for small size chip first CsI thickness 110 μm , diameter 6 μm
Pixel number per strip	4000, 10 x 400 (P x Ny, P = 10, Ny = 400)
Strip size	50 μm x 2000 μm
Number of strip per module	40 (M = Nx / 10), Nx = 400
Sensitive area	2 mm x 2 mm M = 40, strip number, 2 mm = 40 x 50 μm
Maximal frame rate	10 Hz (TBD)
Readout time	TBD
ADC resolution	12-bit, correlated double sample
Dead time (us)	TBD
Dynamic range	TBD

Thank you for your attention