INFN-To updates on WP11.3



Istituto Nazionale di Fisica Nucleare

Developments in 110 nm



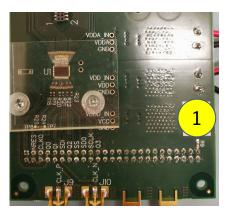
- Many legacies with previous projects
- Efficient re-use of IPs
- Not strong motivations to migrate to 130 nm
 - MPWs reasonably cheap
 - Several projects on the same node: internal engineering run

ALCOR ASIC



End of column								TDCs TDCs Control Unit TDCs (x4) Data
10.4			FE biasing					488 um FE + amplifiers + discriminators
Pix3 Col0	Pix3 Col1	Pix3 Col2	Pix3 Col3	Pix3 Col4	Pix3 Col5	Pix3 Col6		 Digital I/O on the bottom side
Col0	Col1	Col2	Col3	Col4	Col5	Col6	Col7	 Analogue I/O on the top side
Pix2	Pix2	Pix2	Pix2	Pix2	Pix2	Pix2	Pix2	 4 LVDS serializers (one every t columns) for data transmission
Pix1 Col0	Pix1 Col1	Pix1 Col2	Pix1 Col3	Pix1 Col4	Pix1 Col5	Pix1 Col6	Pix1 Col7	 End of Column performs read and SPI configuration
Pix0 Col0	Pix0 Col1	Pix0 Col2	Pix0 Col3	Pix0 Col4	Pix0 Col5	Pix0 Col6	Pix0 Col7	 SiPM connection through wire bonding pads (top side)
	國際開始黨		Тор р		國主義改革			pixel size 440 x 440 µm ²

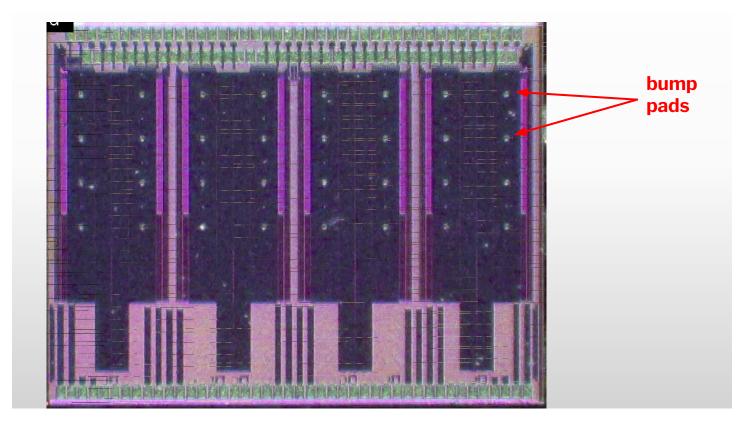
- Extensively characterised
- Engineering run production, several samples





ALCOR ASIC for



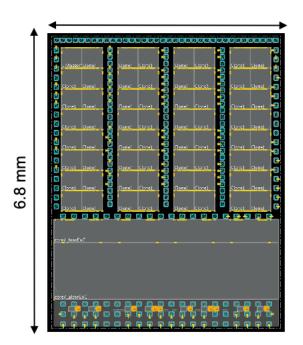


- INFN lbis_next project
- Direct bump bonding with mini-SiPM

Example of use

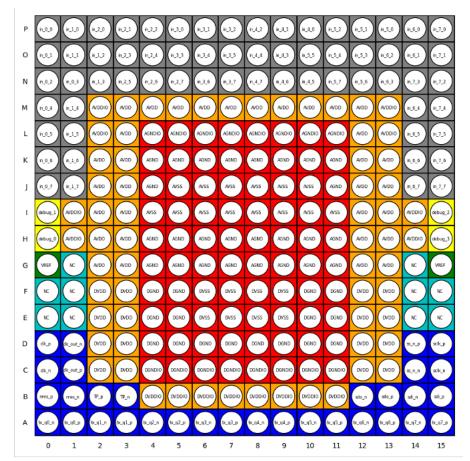


• ALCOR for EIC RICH detector



8x8 pixel matrix ASIC (64 channels)

- SiPM inputs bump pads between the pixel sectors
- Digital EoC in the bottom part



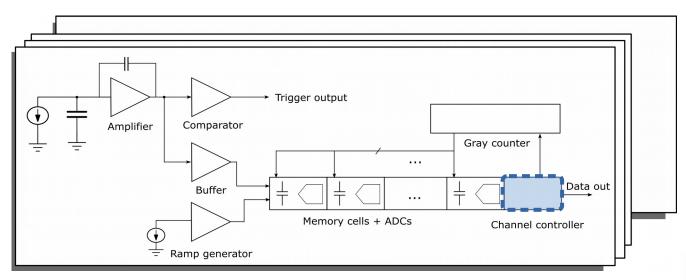
256 balls BGA package (size = 12-16 mm)

- Power and ground on inner/mid contacts
- I/O on outer contacts

Multi-purpose waveform sampling ASIC in 65 nm



- Sample and digitise in an capacitor array
- Each sampling cells contains a Wilkinson ADCs
- Simpler to increase the sampling frequency in future iterations
- 256 digitizing cells, organised in buffers of programmale length for derandomisation



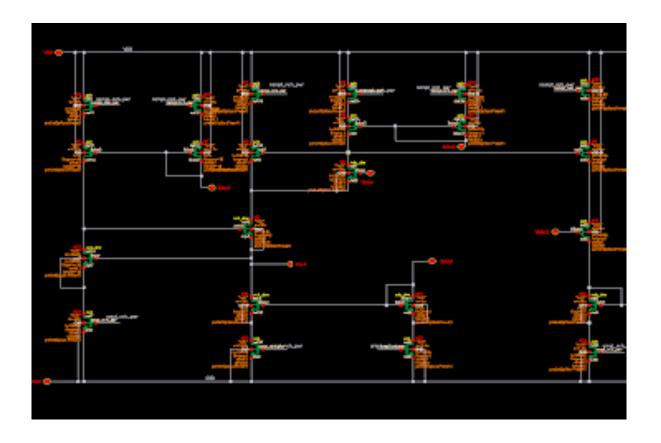




Multi-purpose waveform sampling ASIC in 65 nm

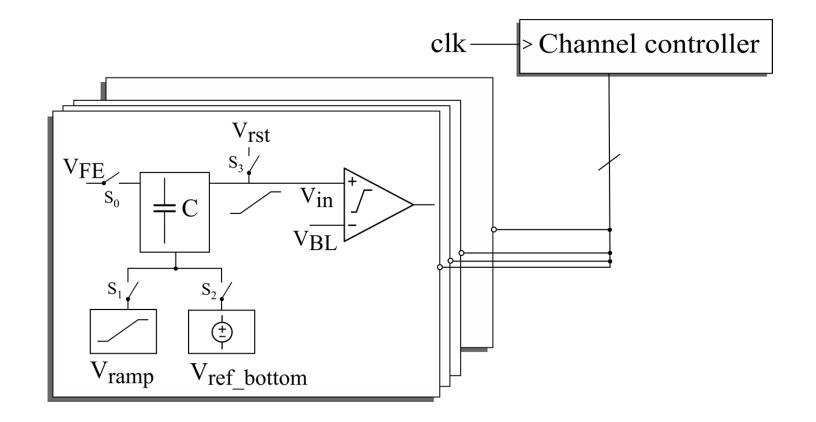


- Present instance has front-end for SiPM
- Fairly easily adaptable to other detectors

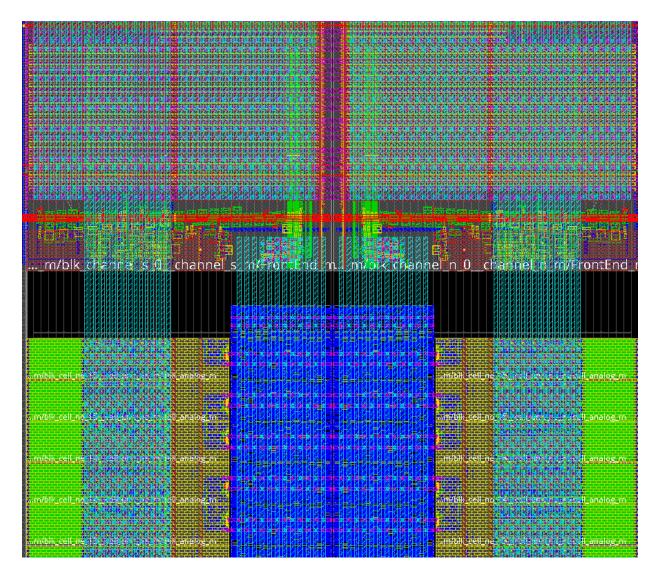


Multi-purpose waveform sampling ASIC in 65 nm





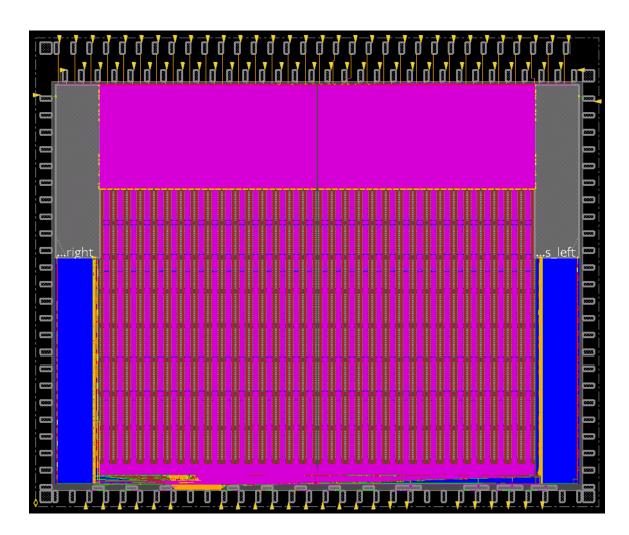
Multi-purpose waveform sampling ASIC in 65 nm



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Multi-purpose waveform sampling ASIC in 65 nm





• Design in final verification phase