

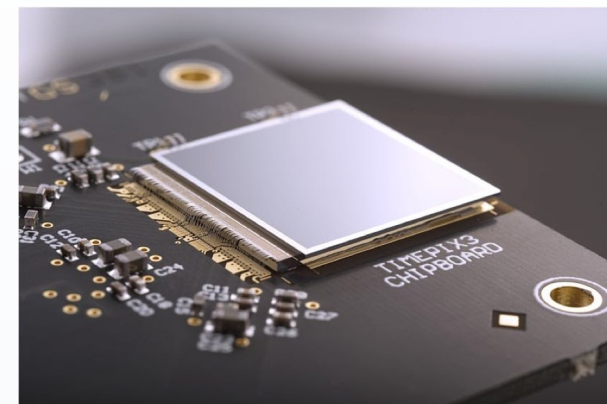
MEDIPIX4-INFN

Main goals

- Acquire from Medipix4 CERN Collaboration the new Timepix4 ASIC bump-bonded to different sensor technologies (Si, Cd-Zn-Te)
- Test the new devices for Medical Applications
- Development of a new fast INFN-read-out
- Development of a new pixelated sensor based on Silicon Carbide

			Timepix3 (2013)	Timepix4 (2019)
Technology			130nm – 8 metal	65nm – 10 metal
Pixel Size			55 x 55 μm	55 x 55 μm
Pixel arrangement			3-side buttable 256 x 256	4-side buttable 512 x 448 3.5x
Sensitive area			1.98 cm ²	6.94 cm ²
Readout Modes	Data driven (Tracking)	Mode	TOT and TOA	
		Event Packet	48-bit	64-bit 33%
		Max rate	0.43x10 ⁶ hits/mm ² /s	3.58x10 ⁶ hits/mm ² /s 8x
		Max Pix rate	1.3 KHz/pixel	10.8 KHz/pixel
	Frame based (Imaging)	Mode	PC (10-bit) and iTOT (14-bit)	CRW: PC (8 or 16-bit)
		Frame	Zero-suppressed (with pixel addr)	Full Frame (without pixel addr)
		Max count rate	~0.82 x 10 ⁹ hits/mm ² /s	~5 x 10 ⁹ hits/mm ² /s 5x
TOT energy resolution			< 2KeV	< 1Kev 2x
TOA binning resolution			1.56ns	195ps 8x
TOA dynamic range			409.6 μs (14-bits @ 40MHz)	1.6384 ms (16-bits @ 40MHz) 4x
Readout bandwidth			≤5.12Gb (8x SLVS@640 Mbps)	≤163.84 Gbps (16x @10.24 Gbps) 32x
Target global minimum threshold			<500 e ⁻	<500 e ⁻

National: M. Fiorini (Ferrara)
Local: S. Tudisco

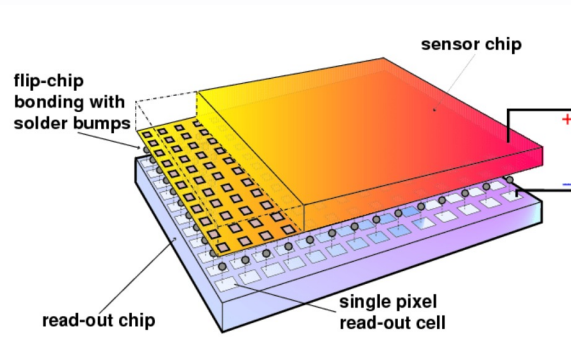
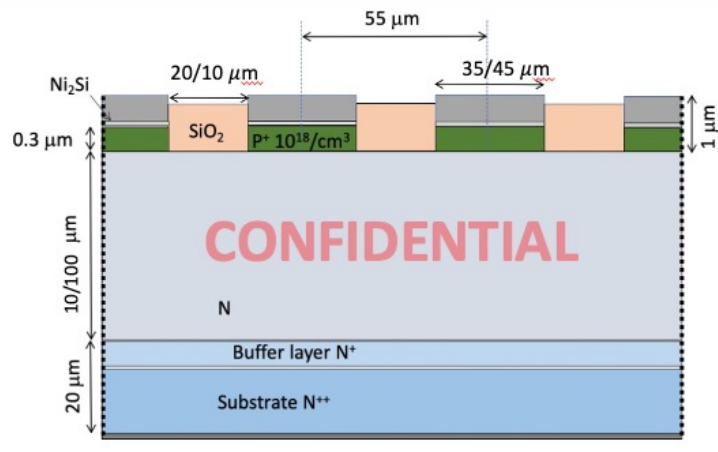


Participants

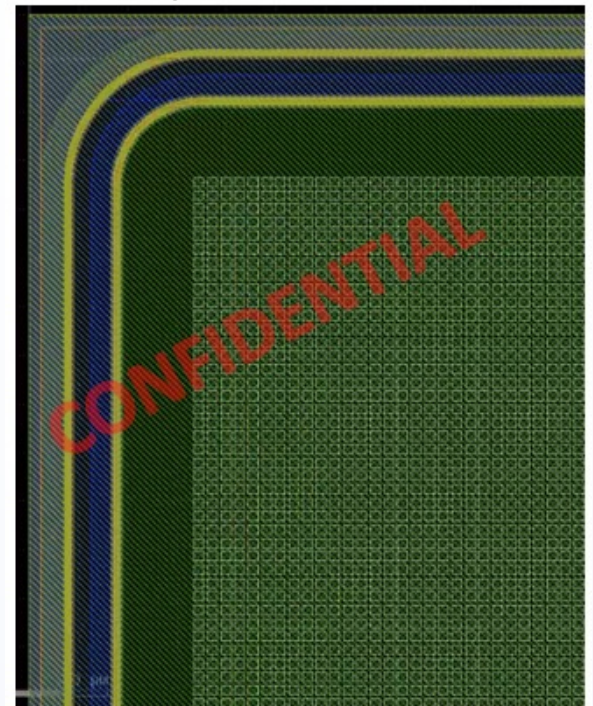
INFN-FE
INFN-LNS
INFN-NA
INFN-PI
INFN-TS

MEDIPIX4-INFN

LNS-Activity



256x256 pixel



Status

- 1) Acquisto wafers SiC
- 2) Definizione ordine alla fonderia

Requests 2023

Consumo	Materials for alpha micro beam	2k€
Inventario	Precision translation stage	2k€
Missioni	Bump bonding alla ADVACAM	3 k€
	Travel for experimental test	2 k€
Totale		9k€

Nome	FTE
S. Tudisco	0.2
G. Lanzalone	0.2
A. Muoio	0.2
F. La Via	0.2
S. Agata	0.4
GAP Cirrone	0.1
totale	