

CHIPIX Activity in LECCE

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Challenges for CHIPIX65

- Design of innovative electronics in strategic area of INFN, using the “novel” CMOS 65nm technology, with a large participation of INFN community
- INFN is one of founding members of RD53, an international collaboration for the R&D phase of an innovative chip for the pixel detector of ATLAS and CMS at HL_LHC, and the goals of RD53 are the main focus of CHIPIX65 milestones:
- Small pixels: 50x50 μm^2 (or 25x100 μm^2)
- Large chips: >2cm x 2cm (~1 billion transistors)
- Hit rates: ~2 GHz/cm²
- Radiation: 1Grad, 10¹⁶ neu/cm² (unprecedented)
- Trigger: 1MHz, 10 μs (~100x buffering and readout)
- Low power - Low mass systems

People in CHIPIX65

	2014	2015	
Bari # FTE Totali	1,65	1,65	
#people	5	5	
Milano # FTE Totali	1	1	
#people	3	3	
Padova # FTE Totali	1,6	1,4	
#people	5	6	
Perugia # FTE Totali	1,4	1,3	
#people	5	5	
Pisa # FTE Totali	1,15	1,35	
#people	5	7	
Pavia # FTE Totali	1,5	1,4	
#people	7	7	
Torino # FTE Totali	1,55	2,25	
#people	5	7	
TOTAL CHIPIX65	2014	2015	
#people	35,00	40,00	5,00
FTE	9,85	10,35	0,5

Design proposal for CHIPIX65

Fully integrated DC-DC converters

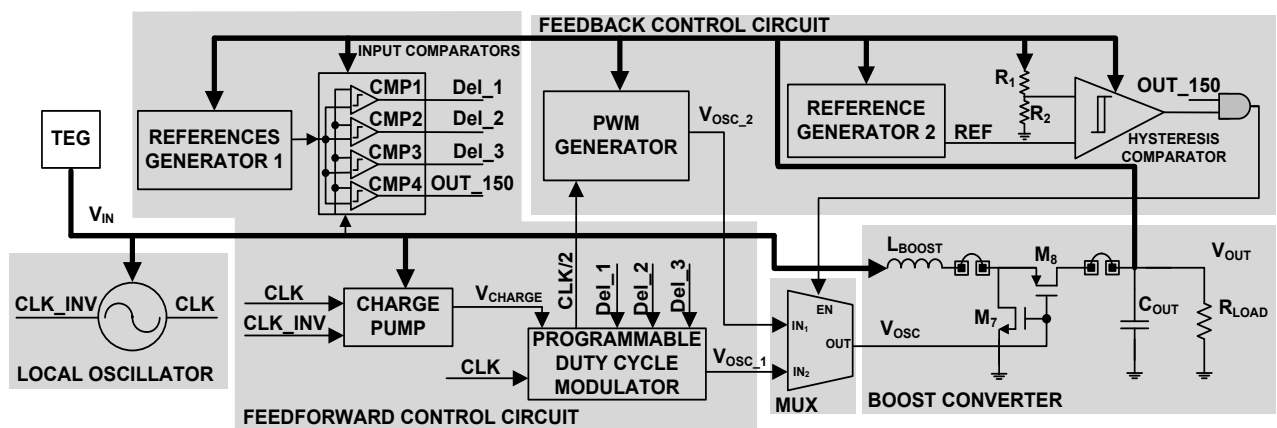
1. $V_{in} = 2.5\text{ V}$ $V_{out} = 1.2\text{ V}$
2. $V_{in} = 2.5\text{ V}$ $V_{out} = 0.8\text{ V}$
3. $V_{in} = 1.2\text{ V}$ $V_{out} = 0.8\text{ V}$

For all, output current : 200mA-600mA

Previous experience

DC-DC converter for uTEG with IMM-CNR

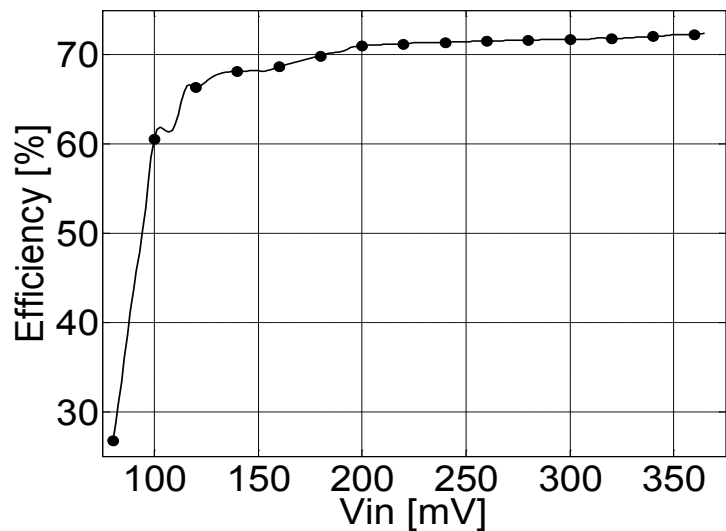
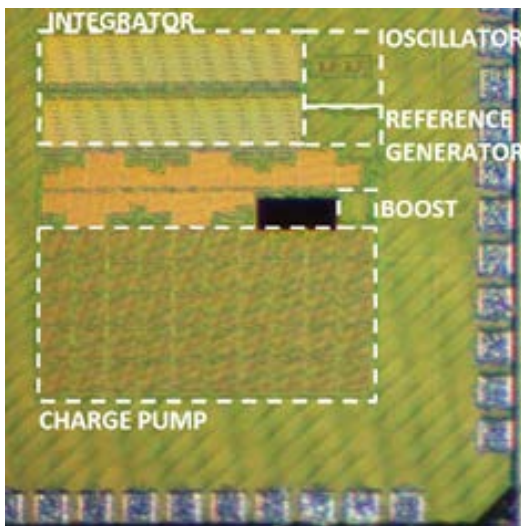
Overall architecture of the DC-DC converter



- 80mV-370mV input voltage range
- 73% peak efficiency

Previous experience

DC-DC converter for uTEG with IMM-CNR



- Chip microphotograph (TSMC 65nm)
Area 0.51mm²

- Efficiency vs. V_{in}
measurements results

People from Lecce

Stefano D'Amico	30%
Carlo Veri	100%

Financial requests 2016

Consumable 3k€

Missions, Services and Equipment charged by the INFN
TO-section