# Teaching module IP : From Design to TEST

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Pr. Grenoble INP

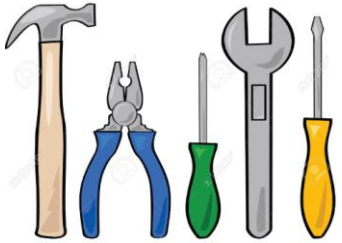
***Panel on new developments @ CMP***

Date : 30/01/2020

# Teaching module IP : From Design to TEST

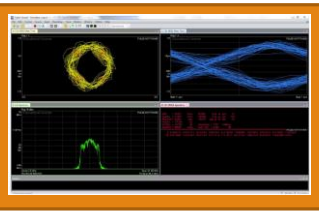
**Share our expreience**

**Propose some tools for teachers**



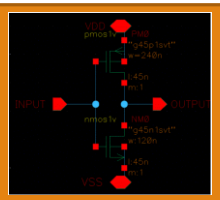
# What we do

## 1st Year (2nd year of Engineering School)

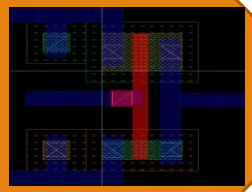


**System Study**
- 12 Hours
- Matlab and ADS

**Project Management Case study**
- Team organization
- Work flow definition

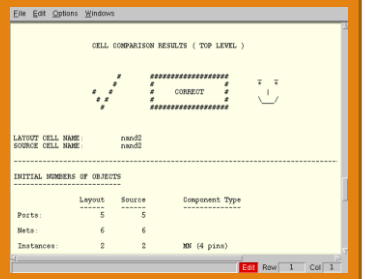


**Schematic level design**
- 40 Hours
- Virtuoso



**Layout design**
- 40 Hours
- Virtuoso

**Deliverable**




**DRC and LVS clean GDS**

## 2nd Year (3rd year of Engineering School)

**Based on Student's IPs and Back-up IPs**

4 Practical Training

- PA measurement (NL - VNA)
- PLL measurement (SA, Phase-Noise)
- LNA measurement (Noise – VNA - SA)
- System measurement (89600-Modulation, ACPR …)

# What we propose

**Propose a framework to the academic community to teach RFIC**

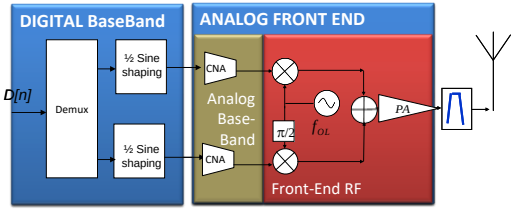
**Students**

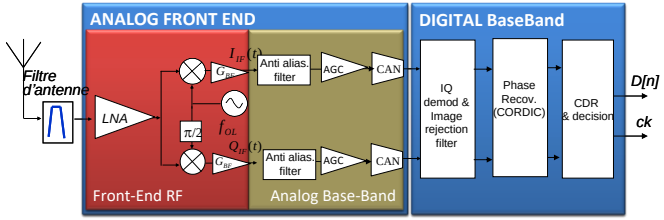
- learn how to design IC
- provide GDS for a tapout
- measure their own circuits

**Teachers**

- PHELMA/CMP provide reference design (IP)
- PHELMA/CMP provide design and measurement tutorials
- Access to MPW with CMP

# What we propose

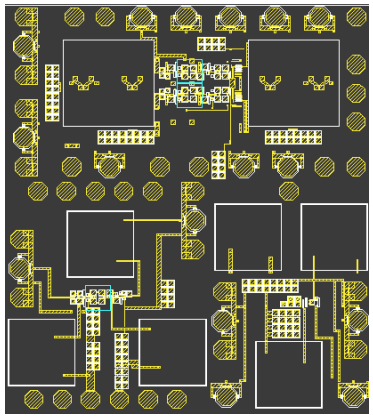



## Reference Design:

## ZigBee Transceiver Building Blocs

- PA
- TX (IQ Mix + PA)
- RX (LNA + Mix)
- LNA
- PLL

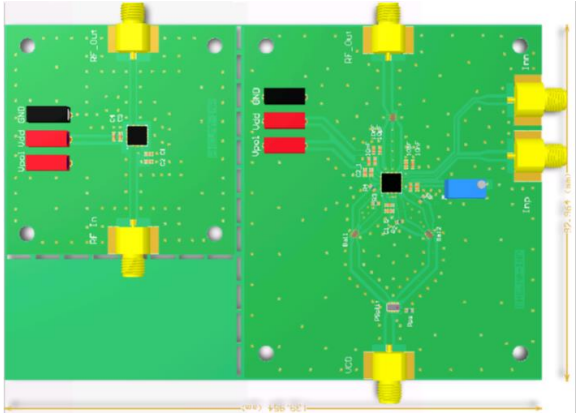


## The Technology

- AMS 035 (BiCMOS)

## Eval Bords :

- 2 ports eval board (LNA / PLL / PA)
- 4 Port eval boars (TX-RX)



# Learning RFIC Design

**Design Tutorials**

- Transciever System study
- LNA
- PA
- PLL
- Gillbet Cell

**Measurement Tutorial**

- VNA based linearities measurements (PA)
- 89600 based modulation measurements (TX or RX)
- PLL measurements
- VNA based SP measurements

# THANK YOU

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