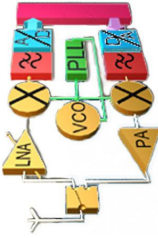
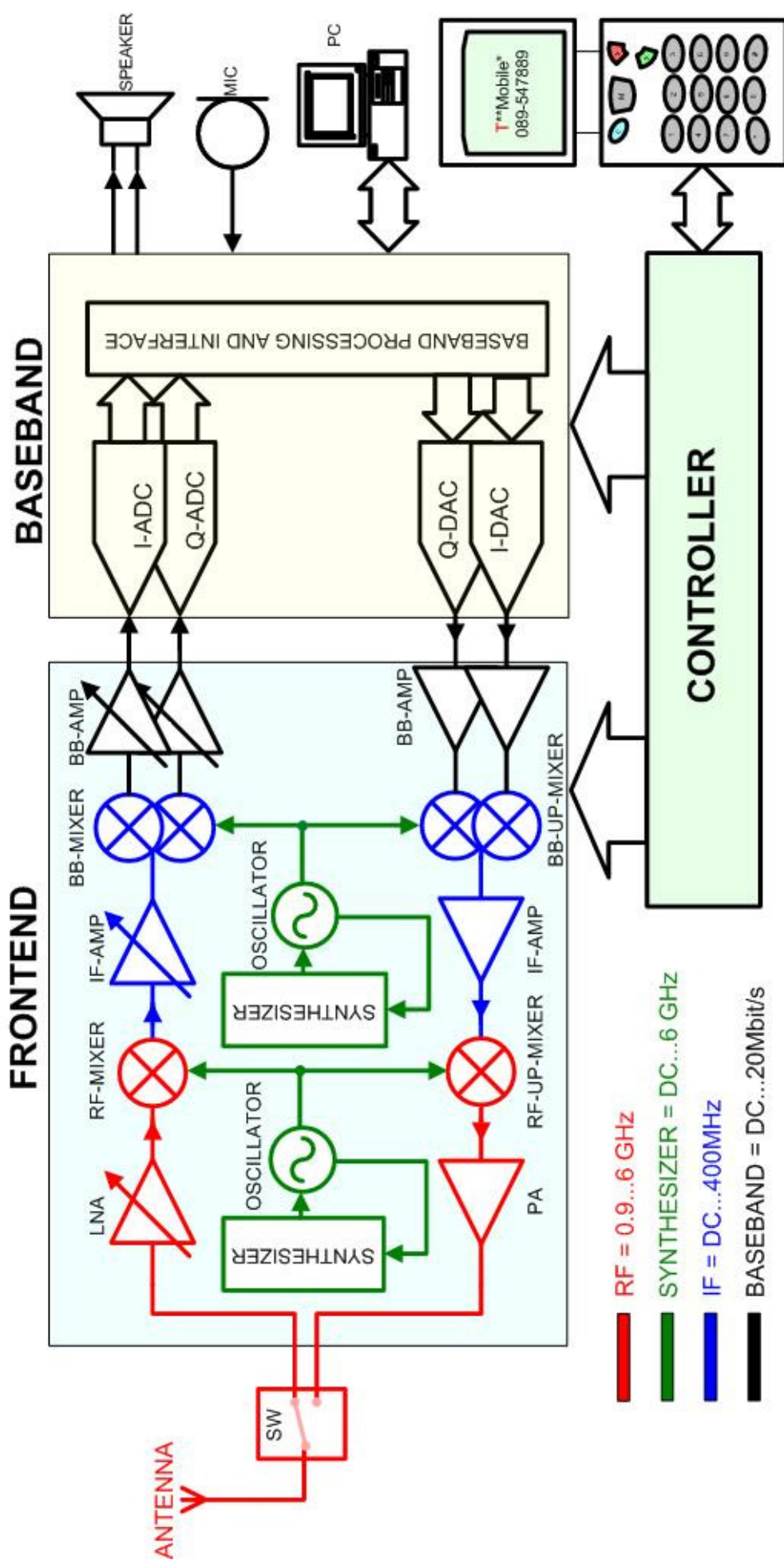


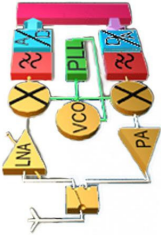
Chair of Circuit Design

Presentation of Chair of Circuit Design Brandenburg University of Technology, Cottbus Prof. Dr. P. Weger M.Sc. Stefan Gerlich

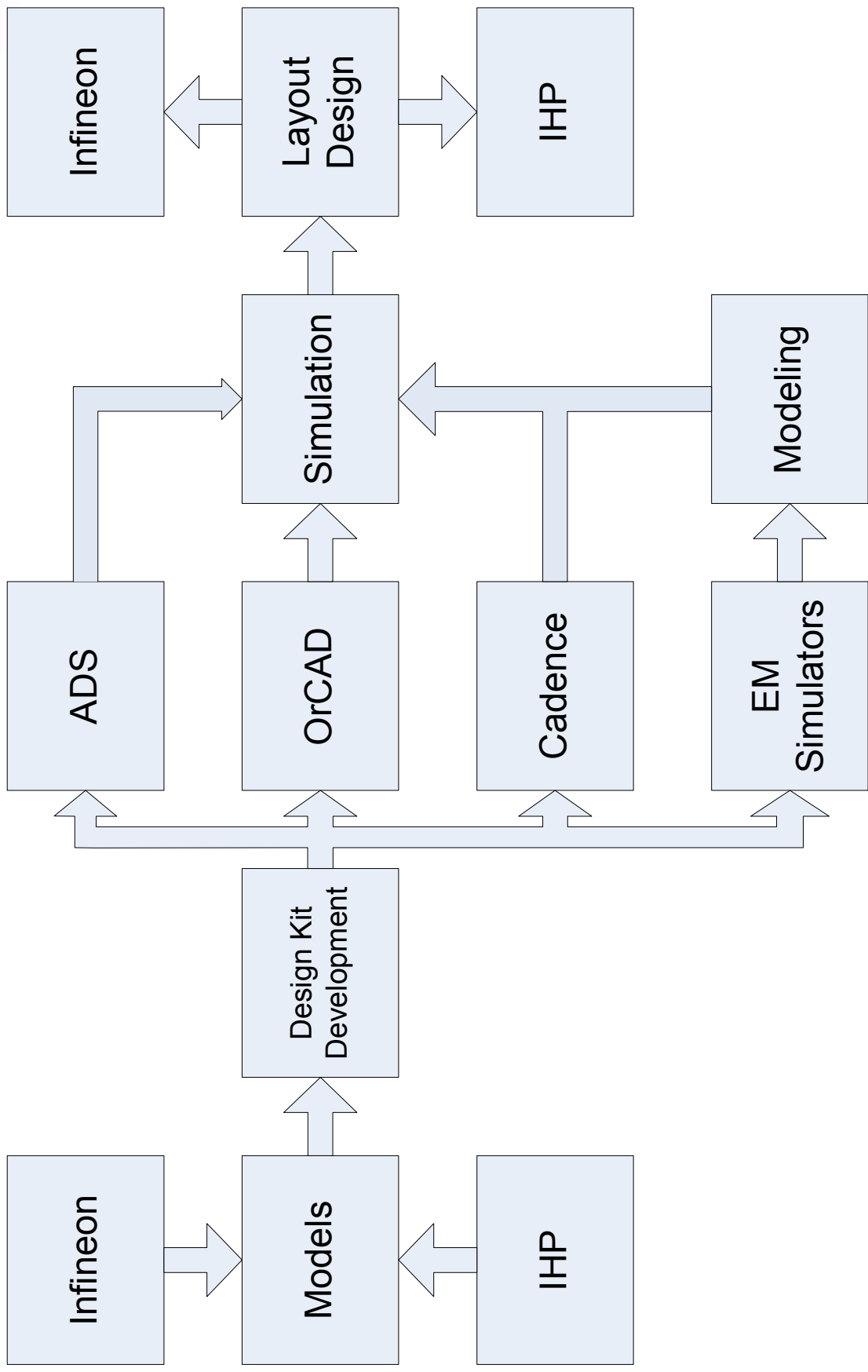


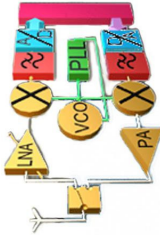
Chip Design



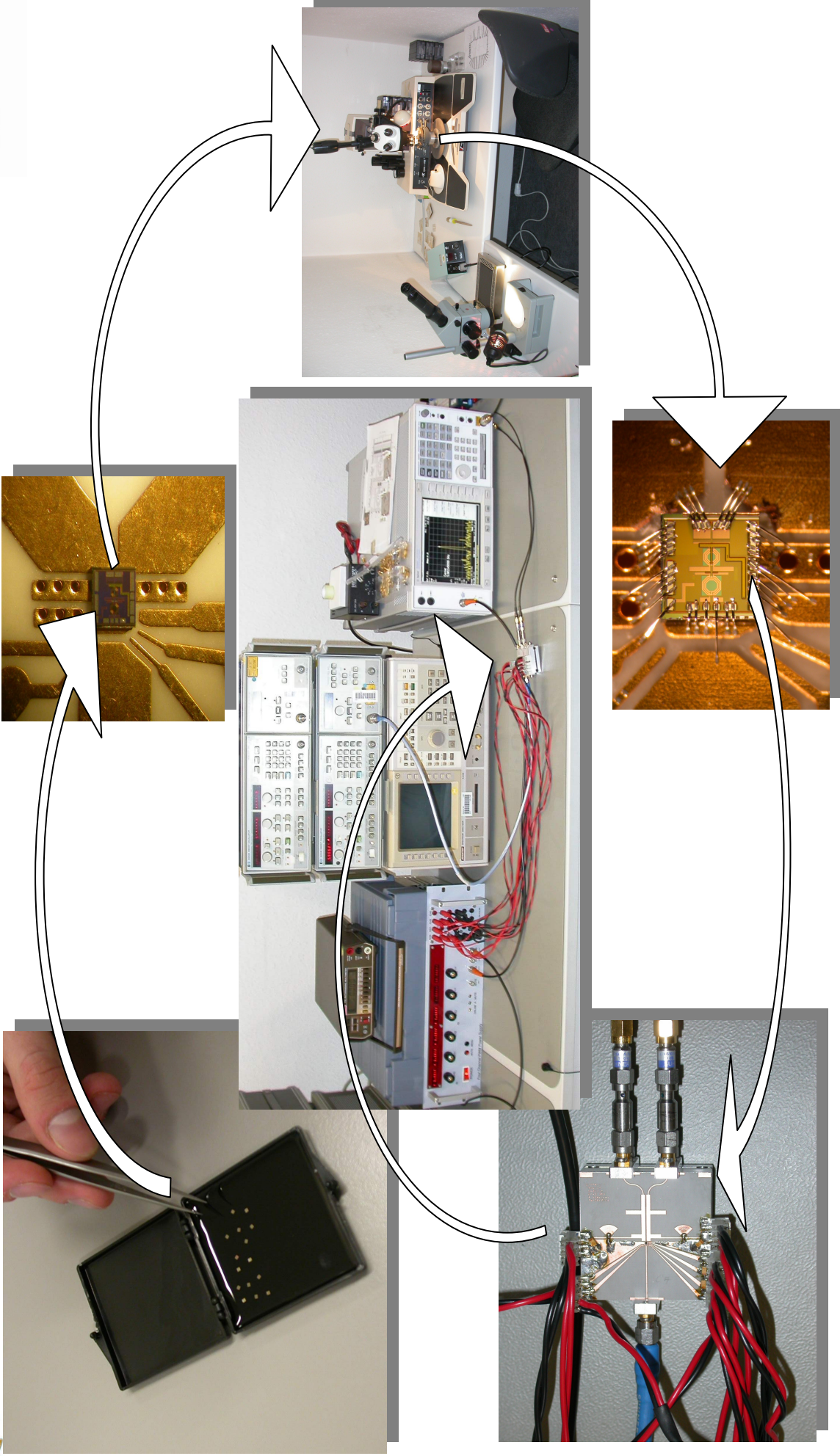


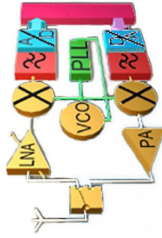
Chip Design: Design Flow





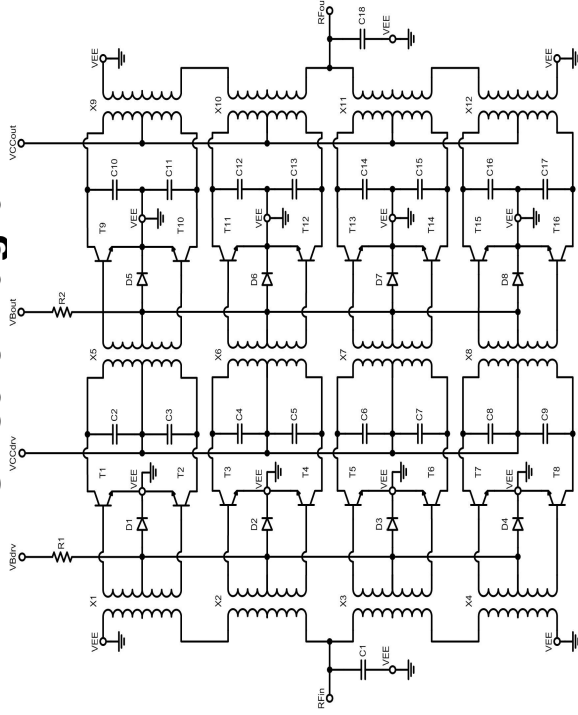
Chip Design: Characterization Flow



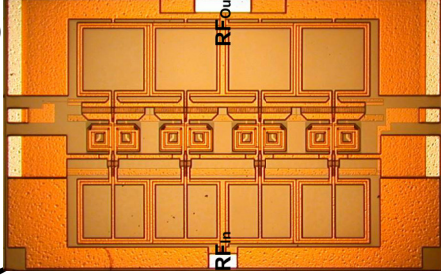


Examples of Design – 2GHz Power Amplifier

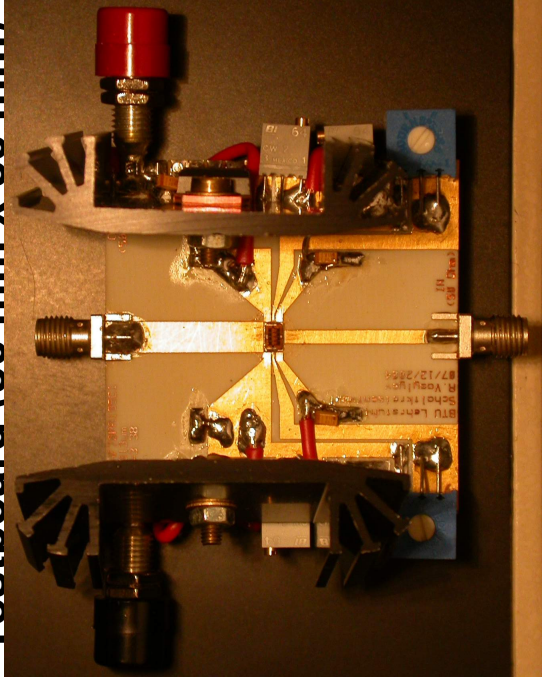
Circuit Diagram



Chip (2.2 mm x 3.5 mm)



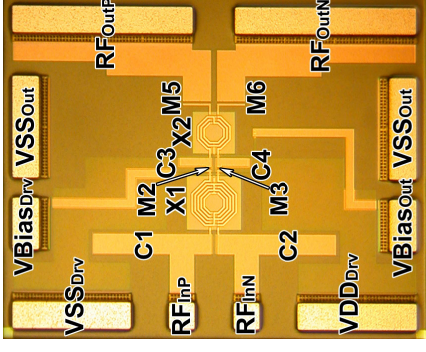
Testboard (50 mm x 50 mm)



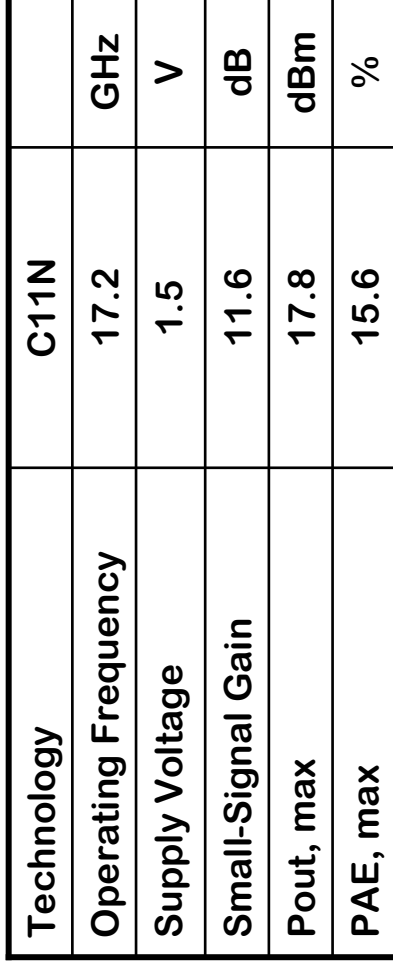
Technology	B7HF70	
Operating Frequency	2.11	GHz
Supply Voltage	3.5	V
Small-Signal Gain	32.3	dB
Pout, max	32.3	dBm
PAE, max	30.5	%

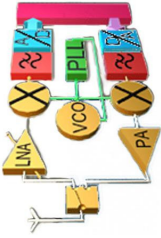


Circuit Diagram

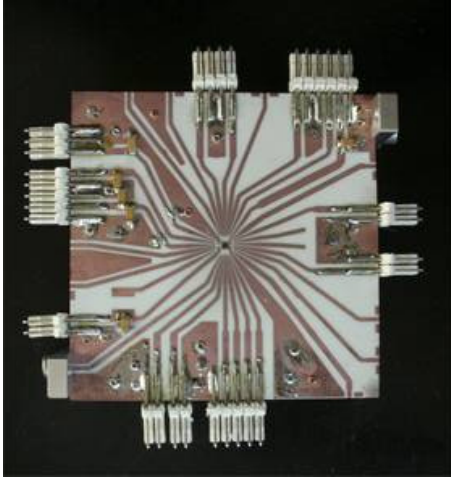
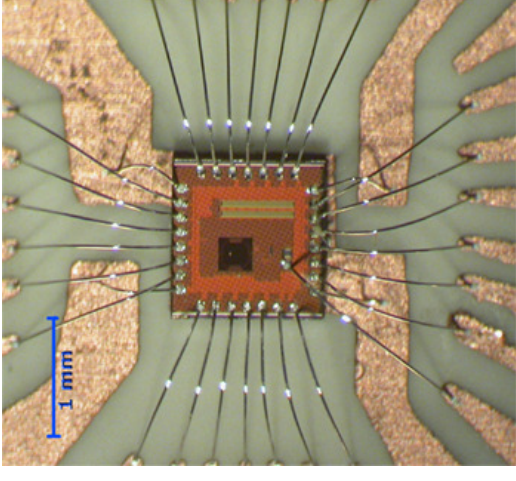


Testboard (30 mm x 30 mm)

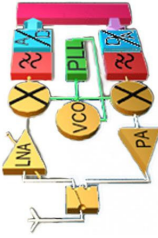




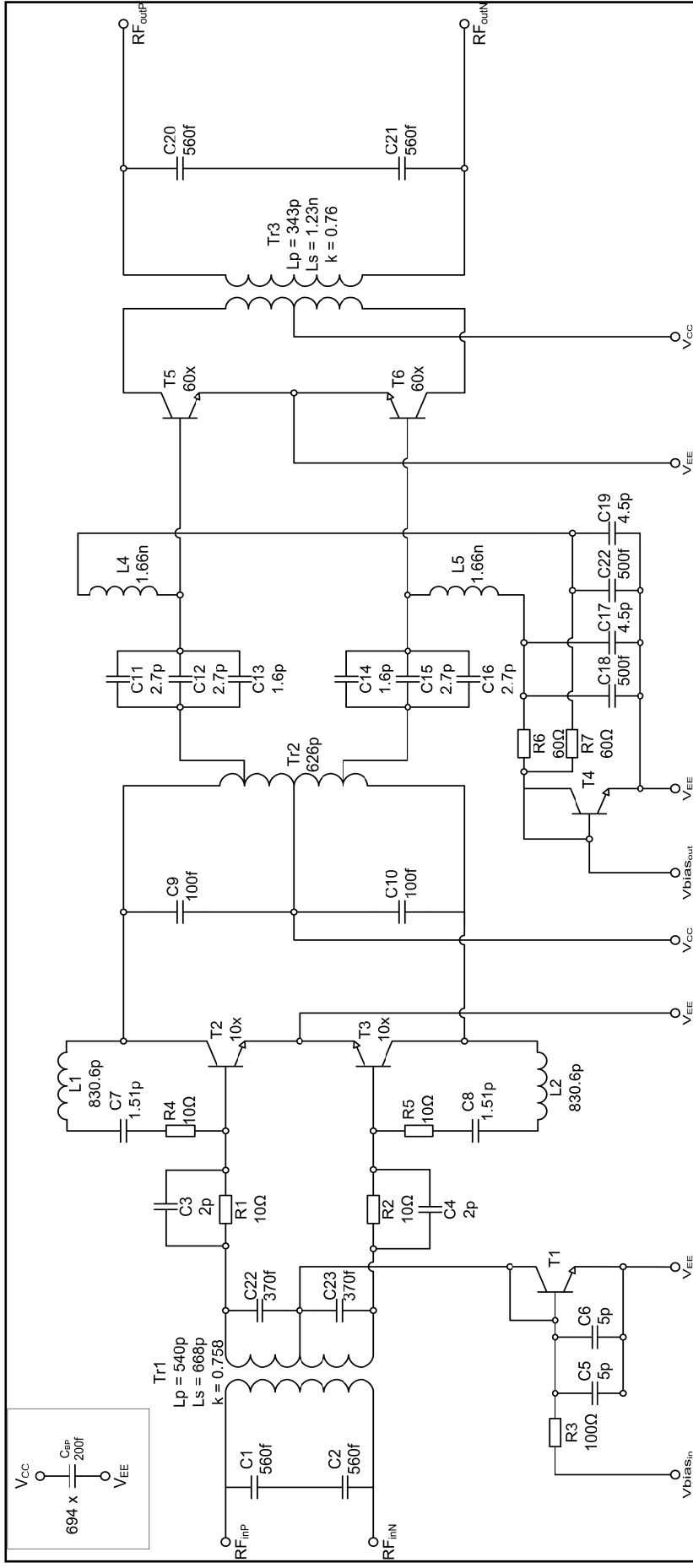
Examples of Design – 4GHz PLL



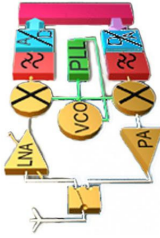
Technology		C11N (IFX, 0.12 μ m, CMOS)
Output Frequency Range		3.9 – 4.4 GHz
Reference Frequency		64 MHz
Phase Noise	@ 10 kHz	-68 dBc/Hz
	@ 1 MHz	-85 dBc/Hz
Supply voltage		1.5 V
Current Consumption		75 mA
Chip area		1.3 x 1.3 mm



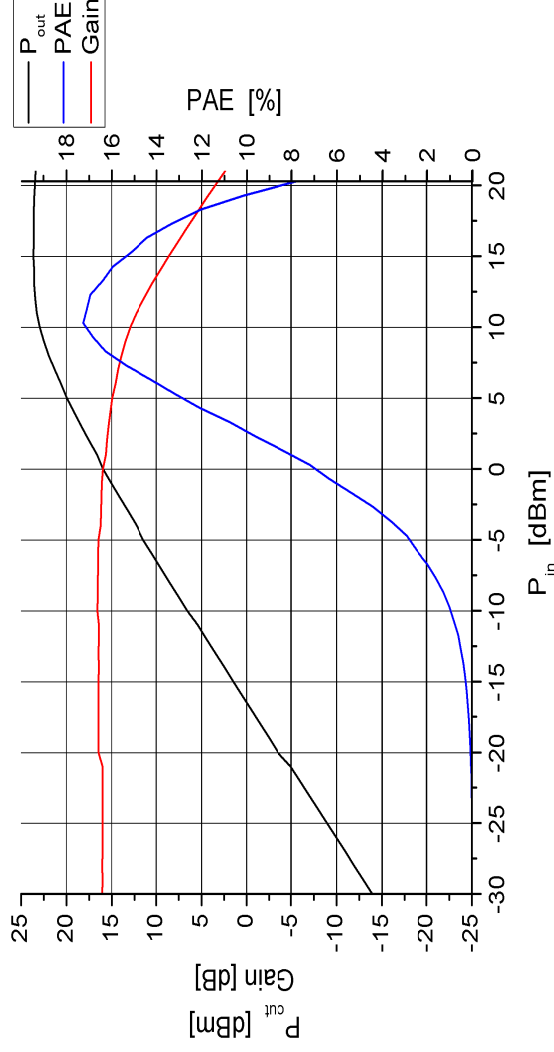
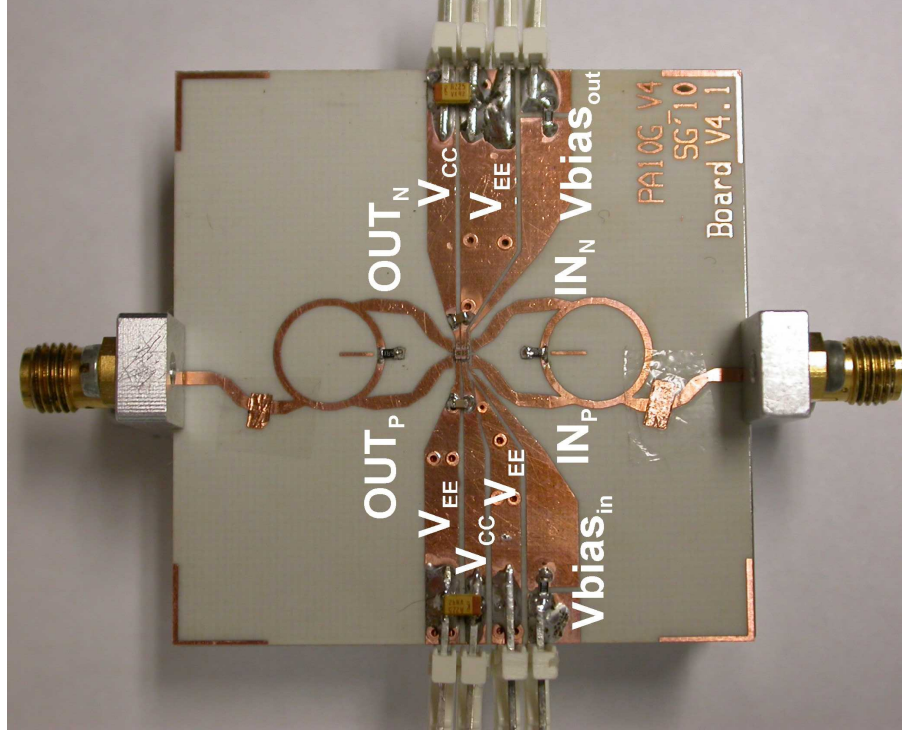
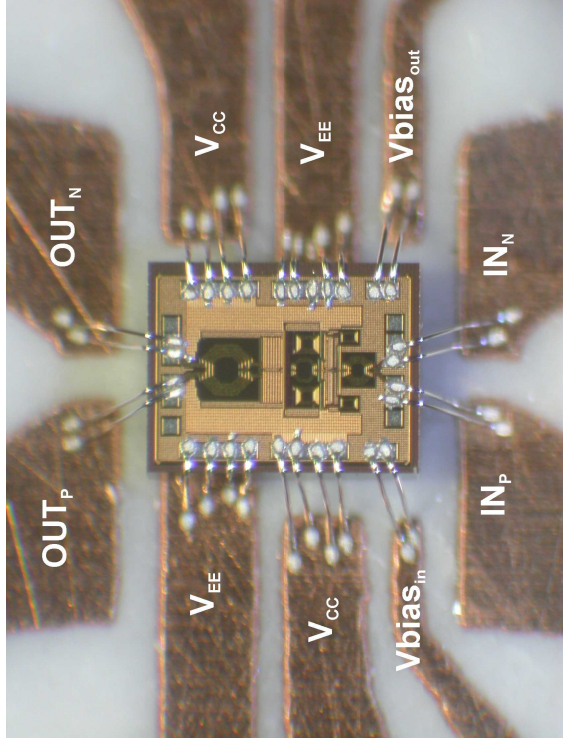
Examples of Design – 10GHz Power Amplifier

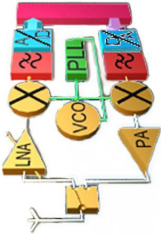


$P_{out,max}$	Gain _{max}	PAE _{max}	1dB-Bandwidth
23.6dBm	16.59dB	17.3%	800MHz



Examples of Design – 10GHz Power Amplifier

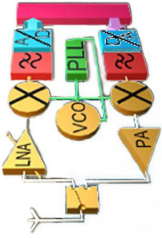




Examples

Further examples of design:

- Power amplifiers for frequency of 10GHz, also with power combining structures
- Low-noise amplifiers (transimpedance amplifier) for frequency of 3GHz, 5GHz, 10GHz
- PLL for frequency of 11GHz



Questions ?



Thank you for your attention

and feel free to ask questions