

Metal Wiring

通过创新合作共赢 在RFSOI设计领域实现突破

Transistor

SOI

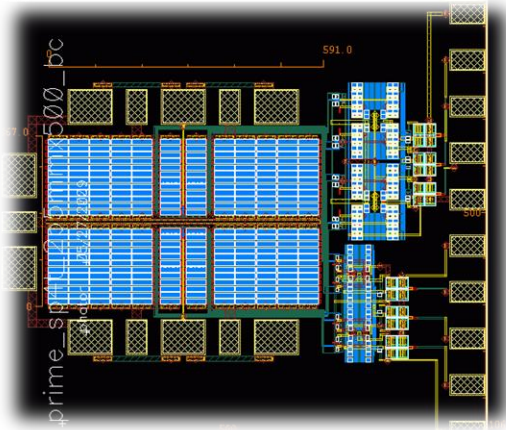
Oxide Insulator

Silicon Wafer

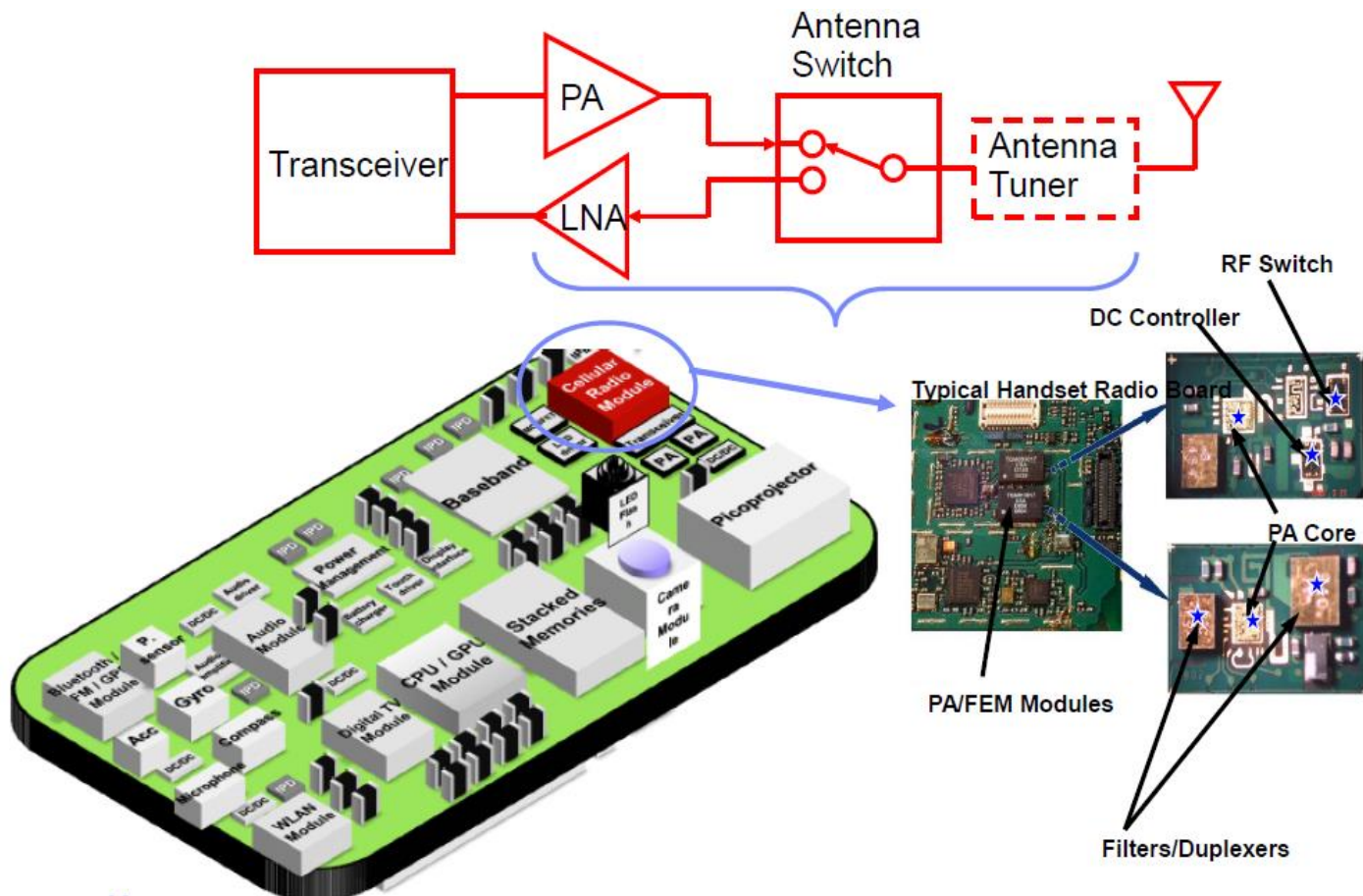
袁泉

MOSIS专业流片服务

RFSOI设计现状



RF SOI 经典应用: 射频开关



射频开关的爆发式增长

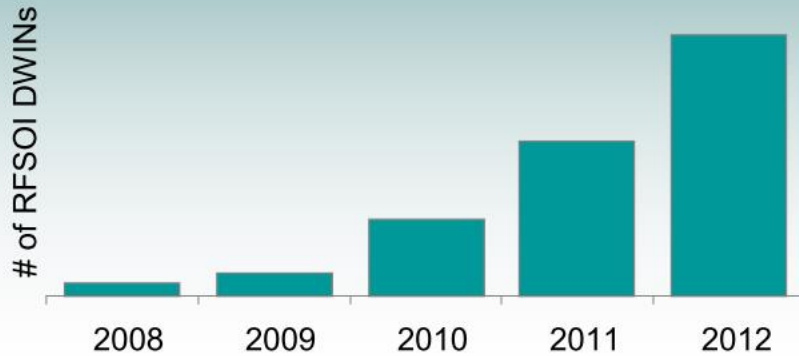
IBM RF SOI

>30 Customers

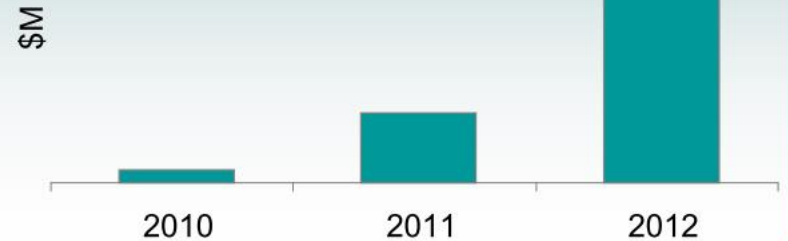
>950 Tapeouts

>5 billion Chips for mobile devices worldwide

IBM RF SOI Design Win Growth

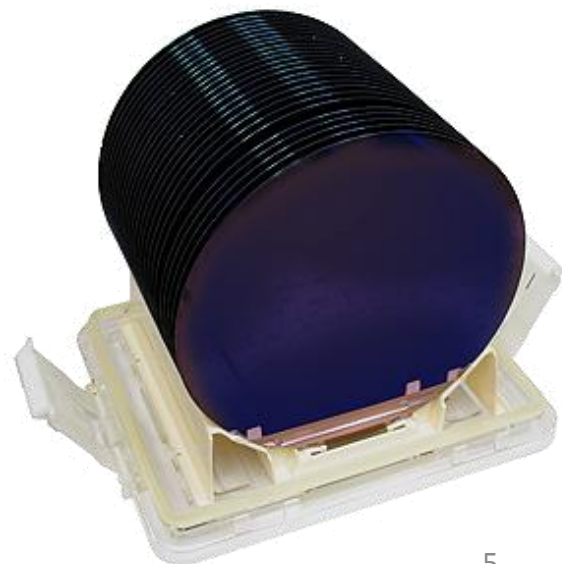
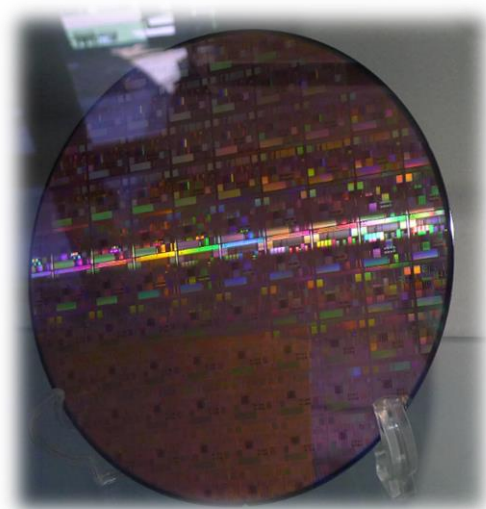
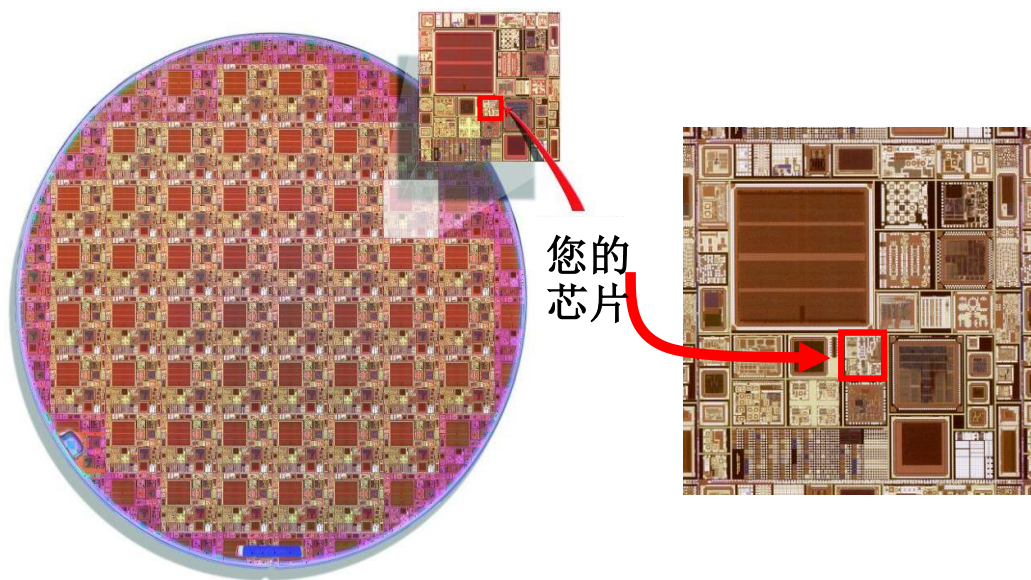


IBM RF SOI Revenue Growth



Data source: IBM, October 2013

MOSIS应对RFSOI产能紧缺



MOSIS应对RFSOI产能紧缺

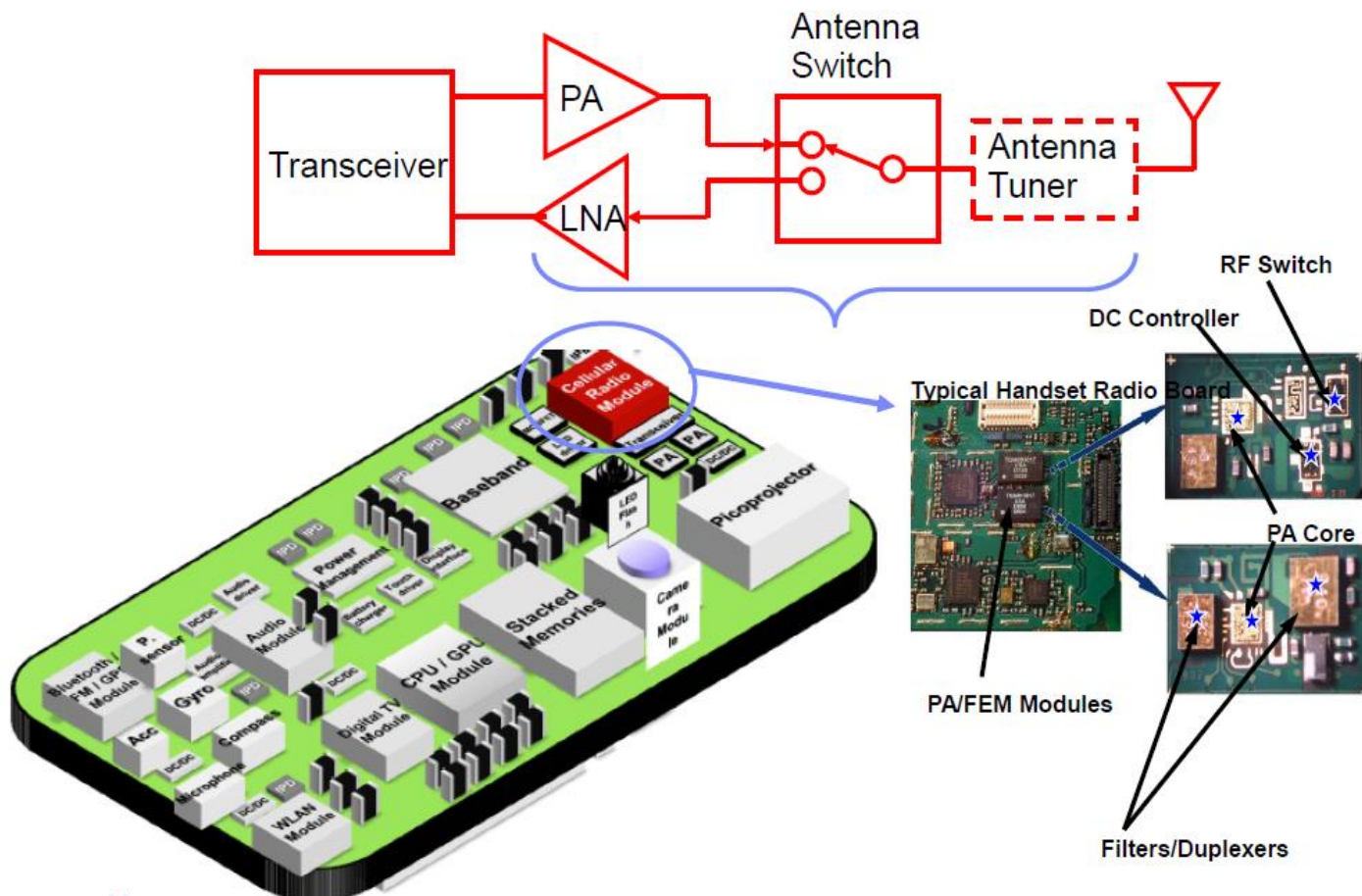
- 对于设计团队:

- 集中精力设计和创新
- 节省开支
- 缩短研发时间
- 便于管理
-

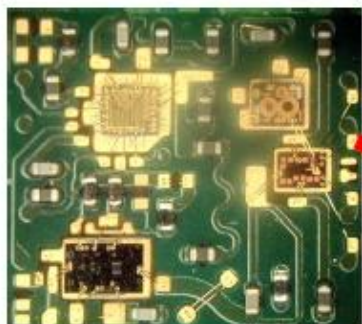
- 对于代工厂:

- 推广工艺
- 照顾更广泛客户
- 便于管理
- 节省开支
-

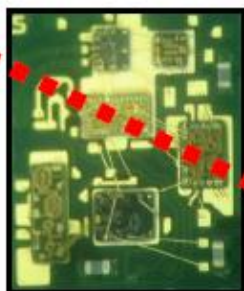
RF SOI 经典应用: 射频开关



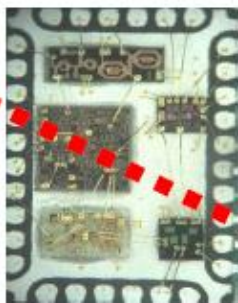
RFSOI拓展应用: 前端模组



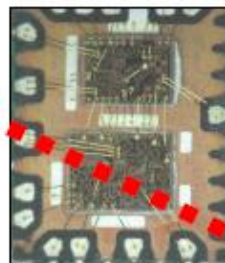
7x8 mm
MCM
2006



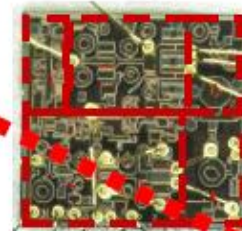
5x6 mm
MCM
2007



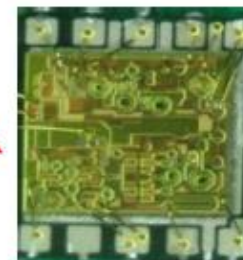
4x6 mm
Multi-Chip
in Package
2008



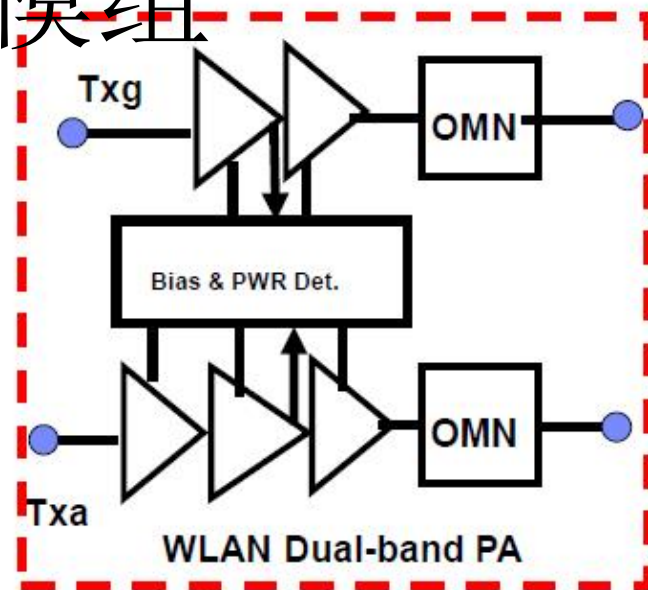
4x5 mm
2-Chip
2009



3x3 mm
Single Chip



2x2 mm
FEIC Chip
PA+SW+LNA



P. Huang, WAMICON 2014

RF SOI 拓展应用案例: RF360



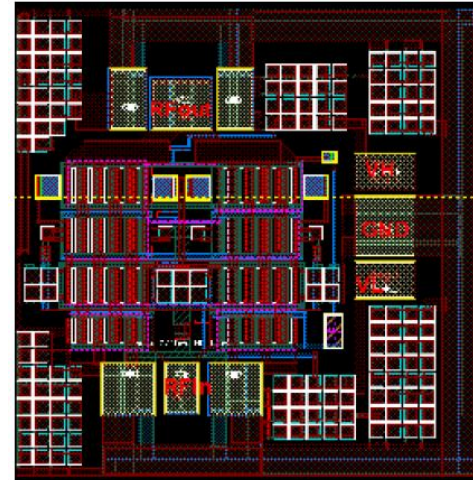
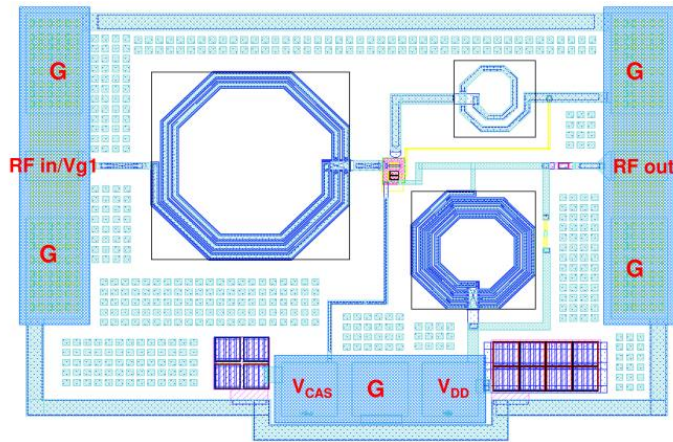
Qualcomm RF360 前端架构解决方案 首个真正意义上的全球系统级4G LTE终端解决方案



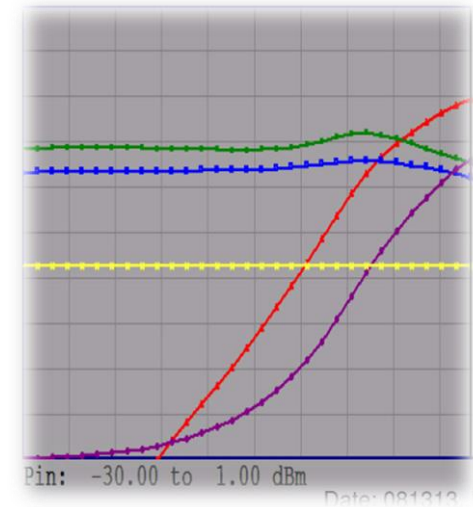
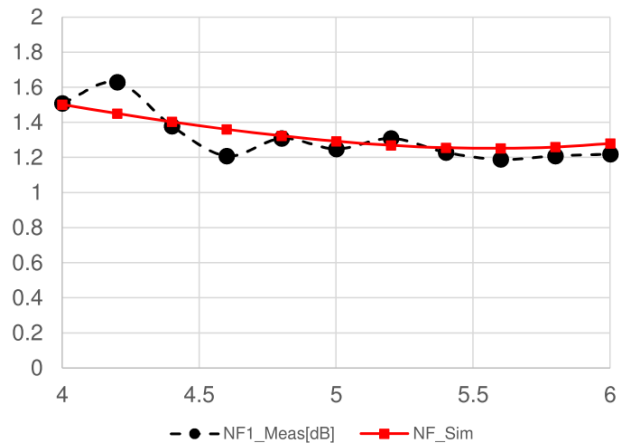
*与美国高通公司之前的RF解决方案相比



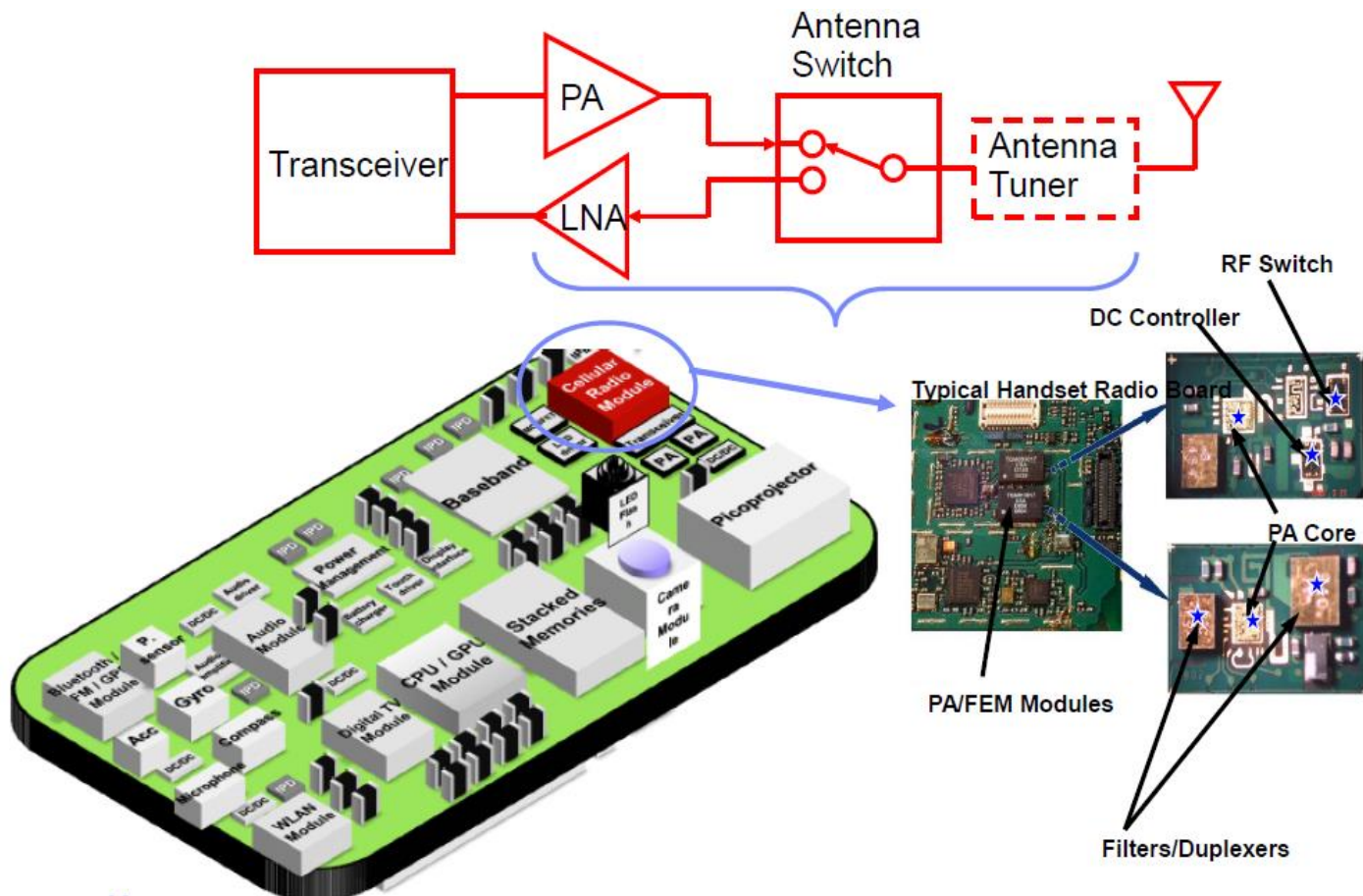
RF SOI 拓展应用: LNA, PA



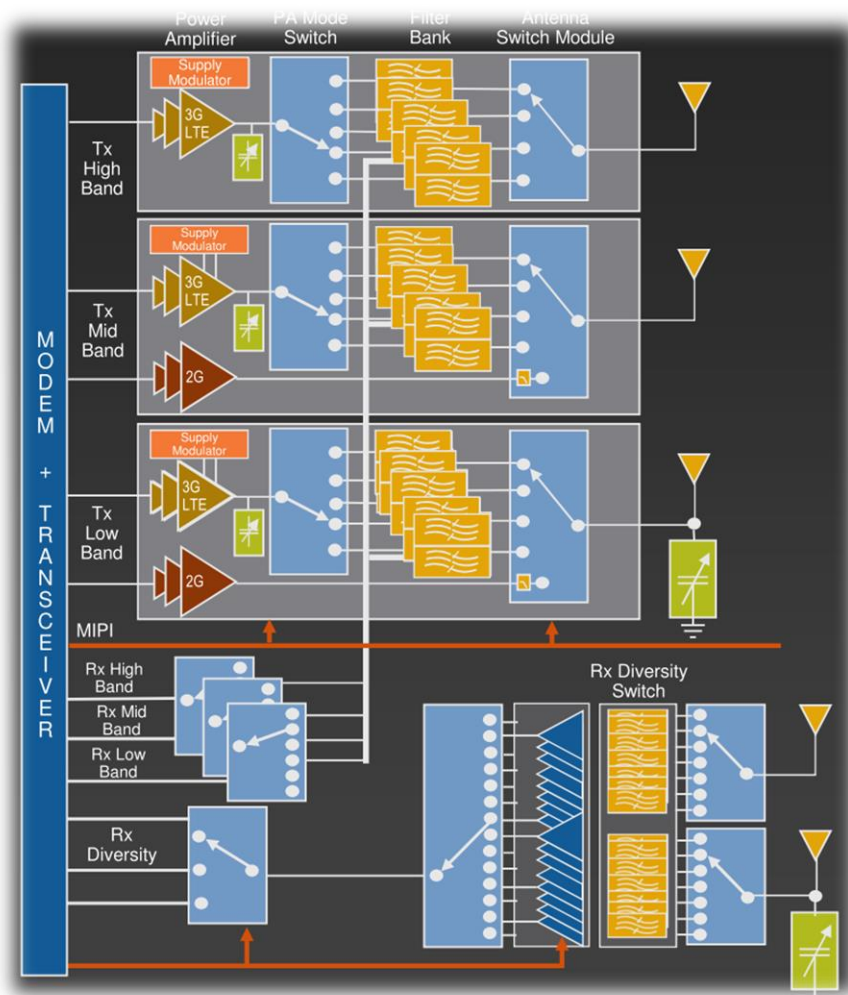
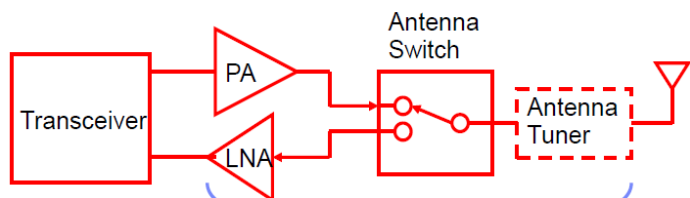
NF vs Frequency: Simulation vs Measurement



RF SOI 拓展应用: 前端模组

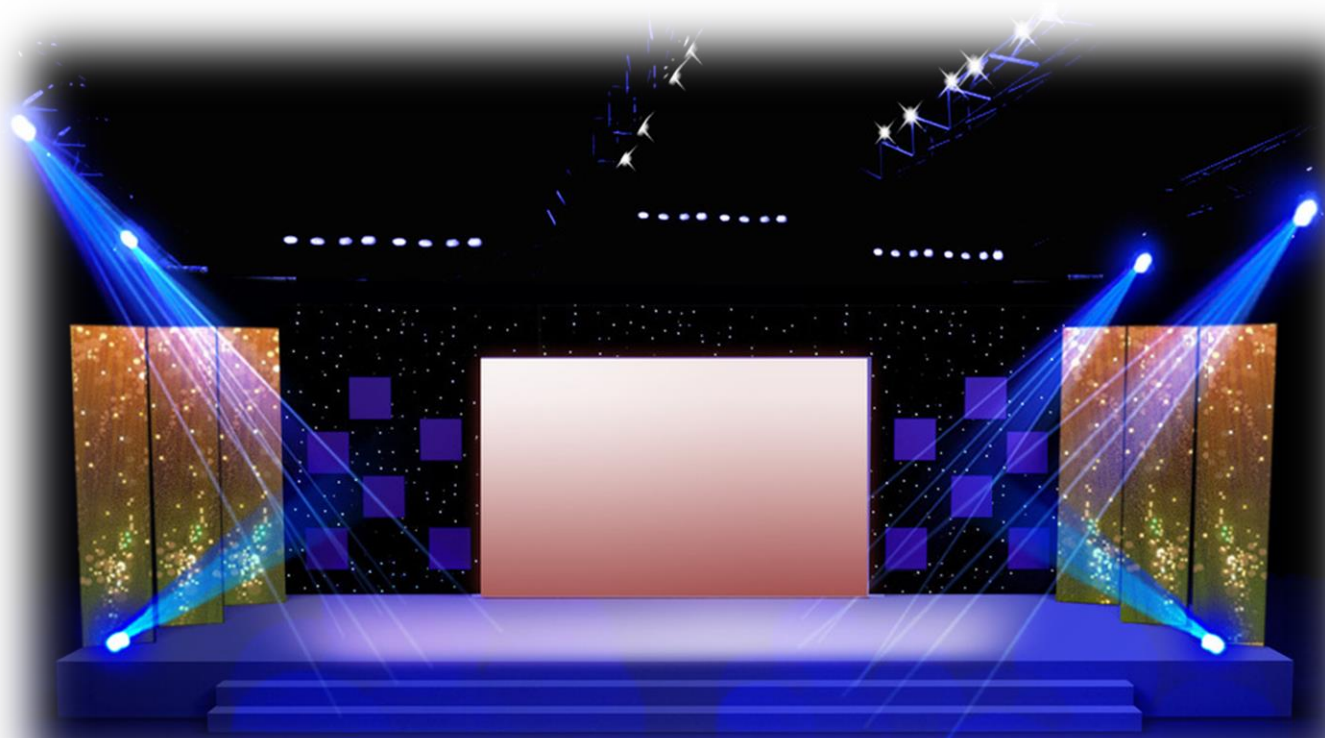


RF SOI深度拓展: 多模多频

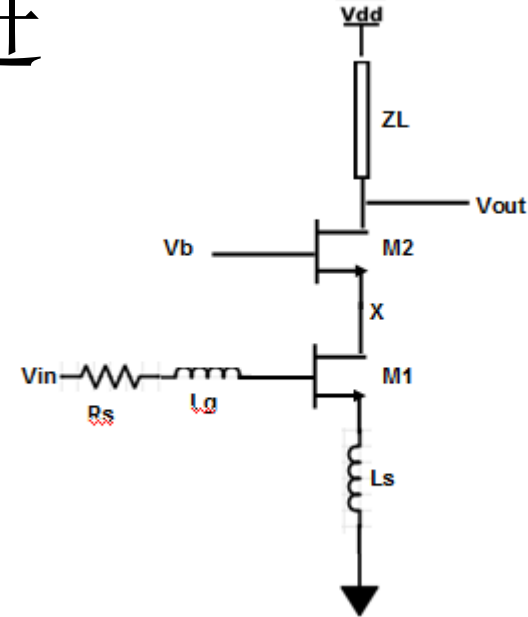
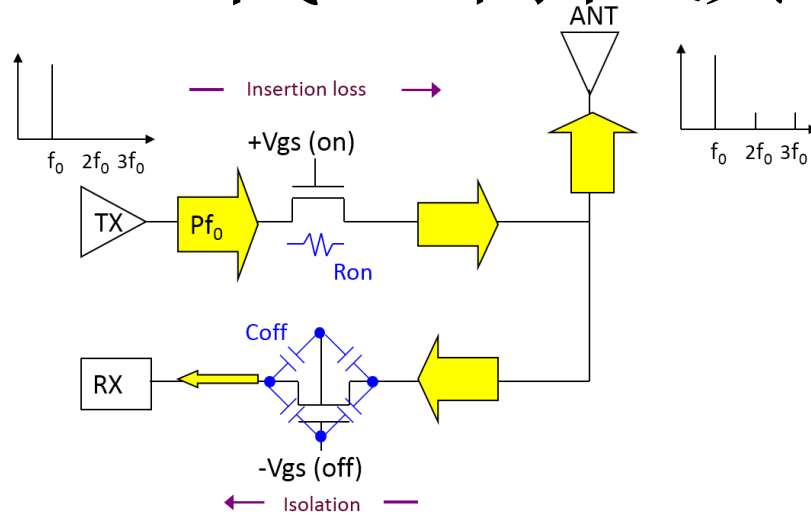


Source: GLOBALFOUNDRIES Product Planning and RF Marketing

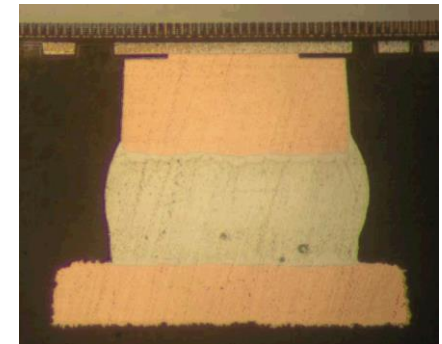
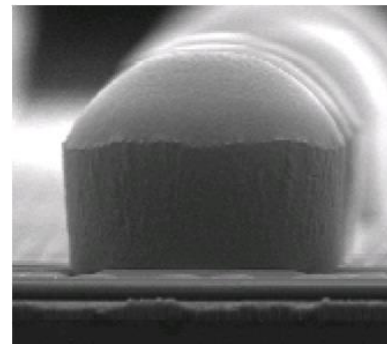
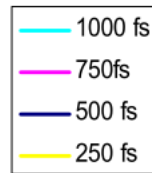
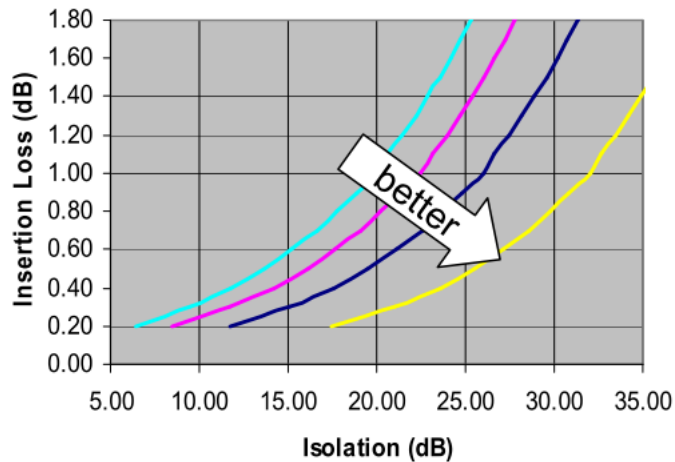
RFSOI设计服务



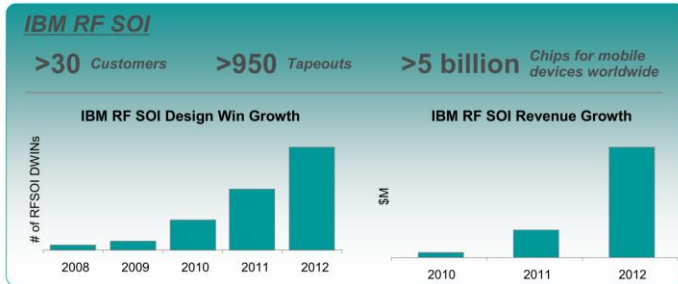
RF SOI 代工制程演进



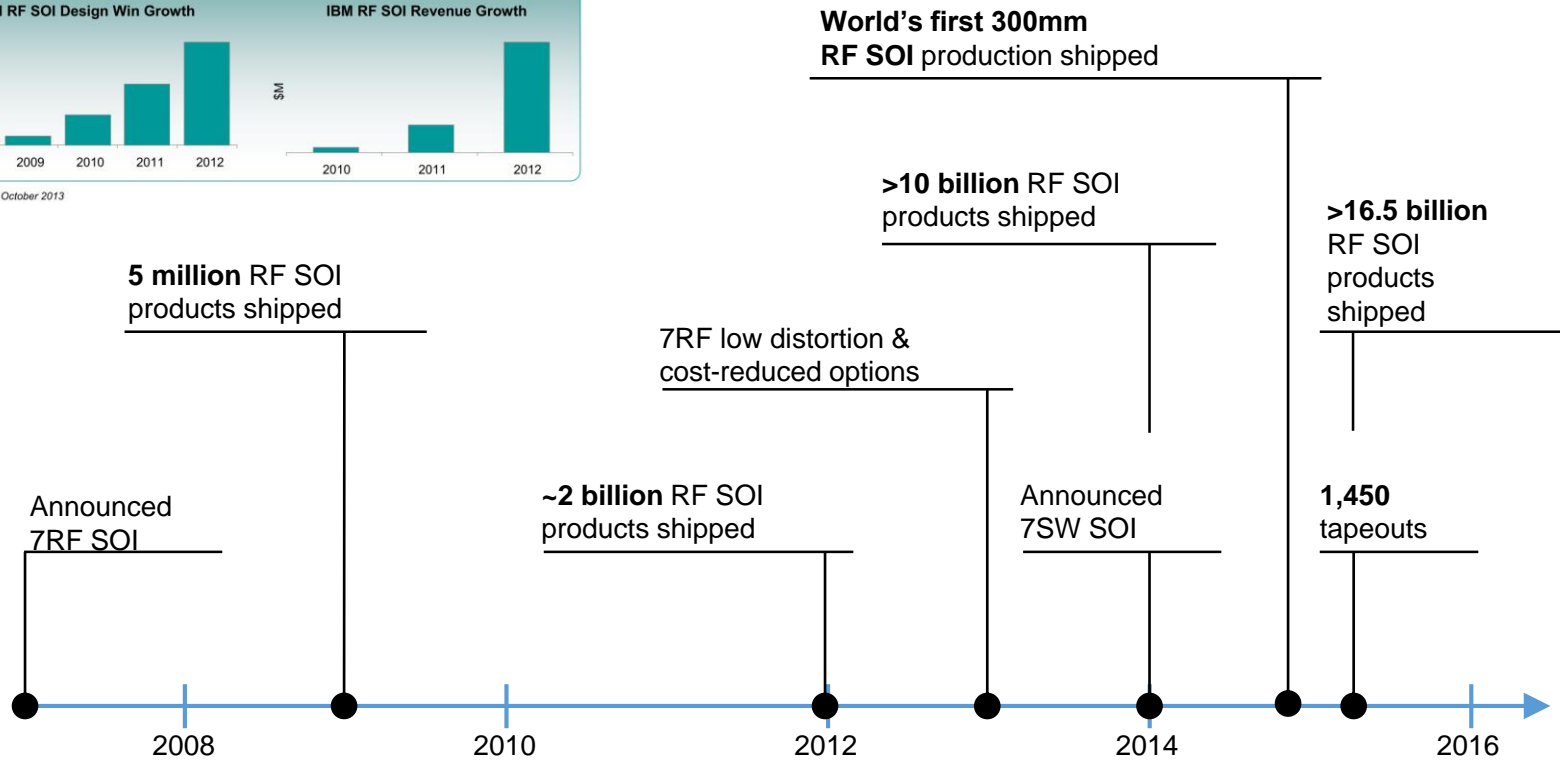
Theoretical Limit: Isolation vs. IL vs. R*C Product (2 GHz)



RF SOI 代工制程演进



Data source: IBM, October 2013



Source: GLOBALFOUNDRIES Product Planning and RF Marketing

下一代RFSOI和前端模组展望

5G is the next evolution of the mobile network:

- Coexistence with 4G/LTE systems
- Millimeter wave for short range & high bandwidth
- Tight coupling between transceiver & FEM / phased array to support beam steering

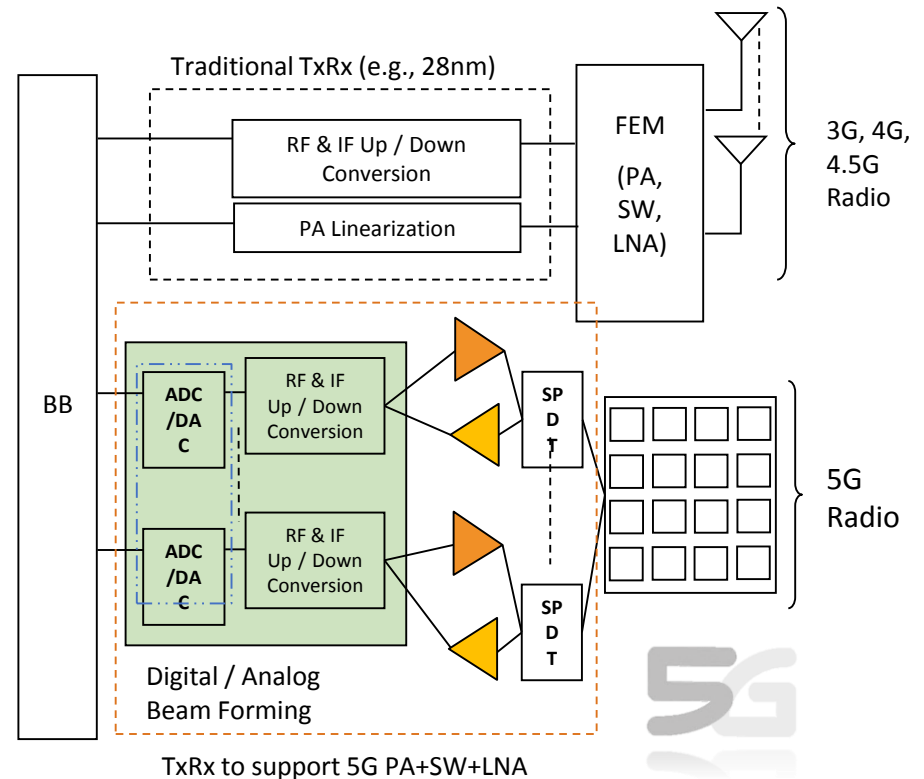
GLOBALFOUNDRIES 45nm RF SOI well suited to support transceiver / FEM integration for 5G:

- Intrinsic device f_T is in excess of 485GHz!!

45nm RF SOI has been extensively evaluated for RF / FEM / mmWave building blocks:

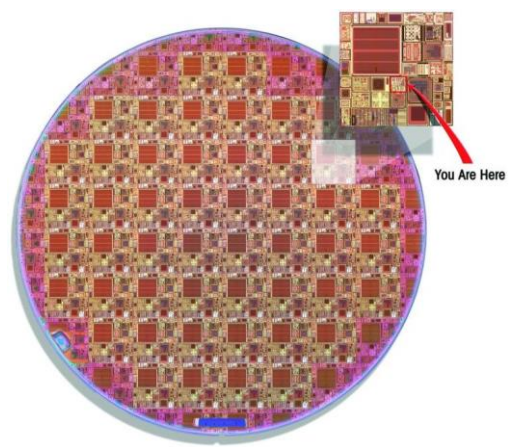
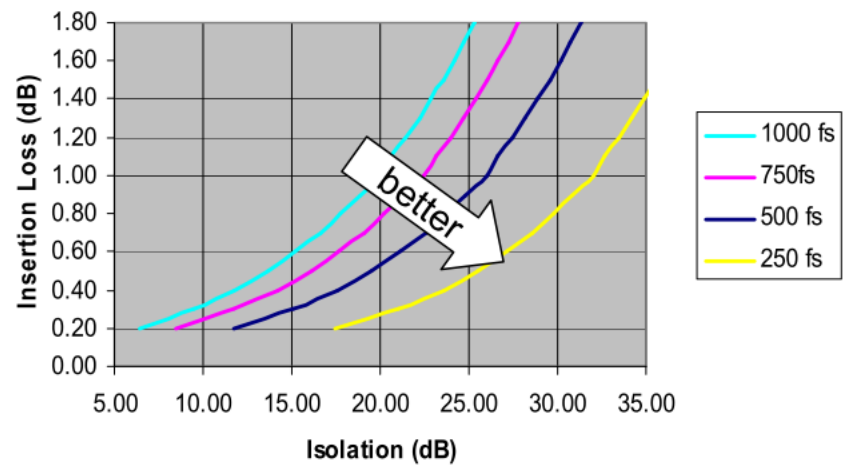
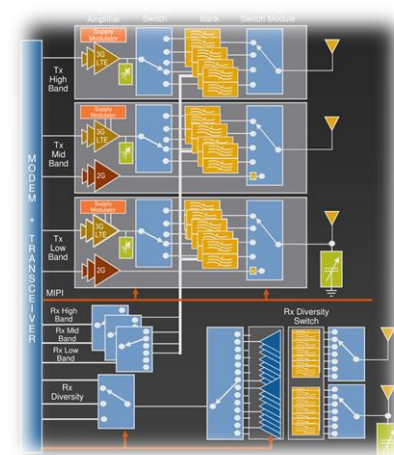
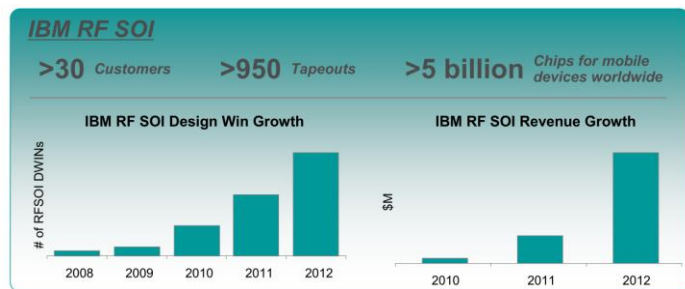
- LNA, switches, multipliers, power amplifiers & mixers
- High efficiency mmWave signal amplification
- Low insertion loss & high isolation for reduced noise

Eval PDK available now for early prototyping



Source: GLOBALFOUNDRIES Product Planning and RF Marketing

总结



谢谢

www.mosis.com