



Overview

- 28nm HKMG gate-first technology with complete RF modelling and PDK focused on high performance RFSOC applications, first pure play foundry RF-enabled 28nm HKMG to market and ready for design!
- Improved digital scaling, low leakage/power and reduced device mismatch exploiting HKMG materials
- Full digital enablement (standard cell library, I/Os, complex IP) for highly integrated RFSOCs
- High Ft process (310GHz) providing designers flexibility in optimizing core RF performance and functionality
- Value-added RF devices for RFSOC integration (triple well, MOS varactor, VNCAP/MOMCap, precision/standard poly resistors)
 - Excellent APMOM density (6.5fF/μm² for 6LM)
 - Excellent MOSVAR tuning range (Cmax/Cmin ~20)
- Optional 5V LDMOS device
- Full Cu BEOL with 3um thick last metal (reference UTM RF inductors provided) and AI RDL
- Wirebond, Copper Pillar and C4 FC packaging options
- Cadence-based PDK with Spectre-compatible and PSP-based RF models

28nm SLP-RF Advantages for RFSOC design

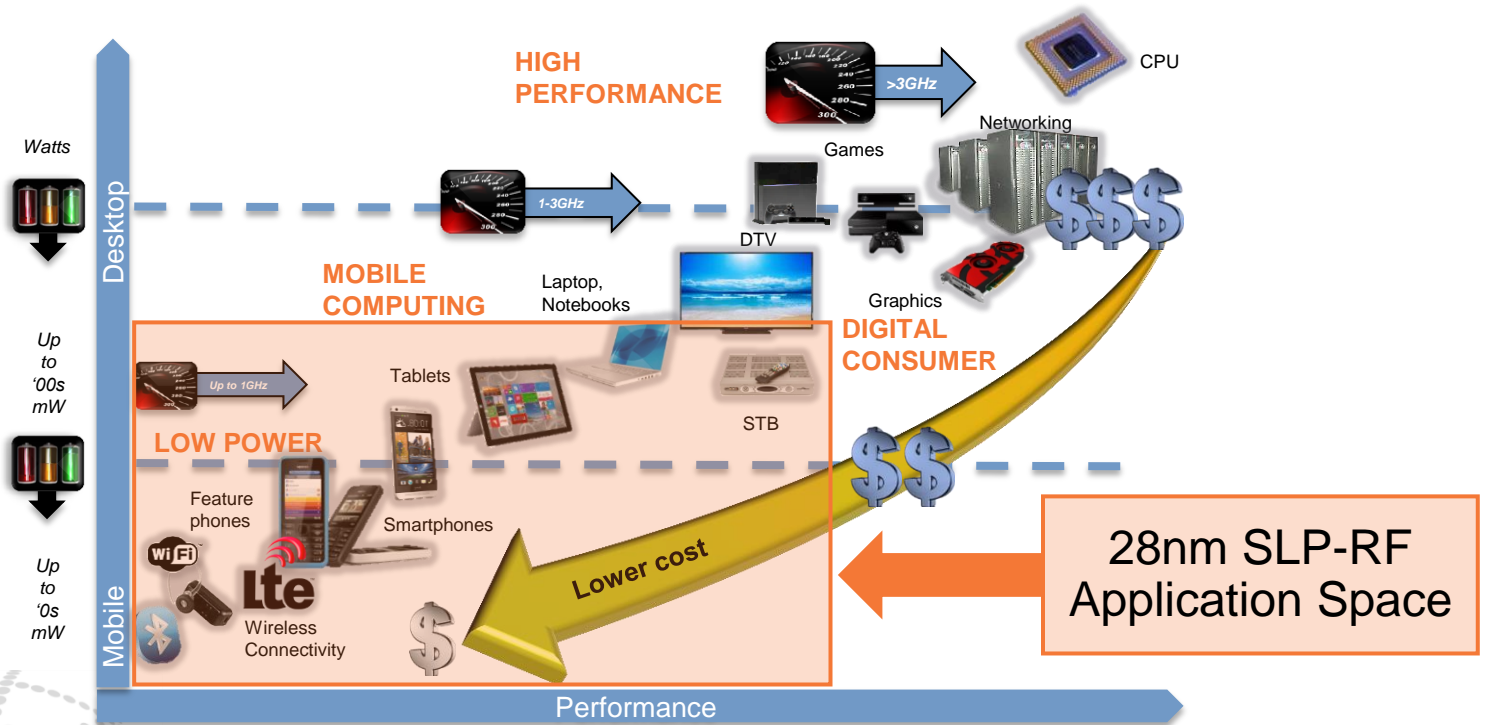
2X+ Gate density*

36% Speed up with full overdrive option*

40% Power reduction for longer battery life*

>1.6 GHz Performance on Cortex-A9

*compared to 40nm LP





28SLP-RF Features

Device	Parameter	28SLP-RF Features
SG NFET, PFET	Peak f_T	310, 185 GHz
EG NFET, PFET	Peak f_T	70, 45 GHz
SG NFET	NF_{min} (dB) @ 2.4GHz & $V_g=V_d=V_{dd}$	< 0.5
	$S_{Vg} * WL$ ($mV^2 * mm^2 / Hz$) @ 1Hz	79
P+ poly	Resistor density (ohms/sq.)	600
N+ diffusion	Resistor density (ohms/sq.)	162
Precision poly	Resistor density (ohms/sq.), +/-11% tol.	1030
N-well	Resistor density (ohms/sq.)	700
MOS Var (NCAP)	Thin Gate Capacitance Density (accumulation)	24.7 fF/mm ²
	Tuning Range (C_{max}/C_{min})	20
	Q-factor @ 2.45GHz ($C=223fF$)	85 (@ accumulation)
MOM	MOM Capacitance Density (6Mx levels)	~6.5 fF/mm ²
	Q-factor @ 2.4GHz ($C=2pF$)	55
VNCap	VNCap Capacitance Density (M1-M3)	3.5fF/ μm^2
Inductors (3um UTM)	Q_{peak} @ 0.17nH, Peak Freq. 22.8GHz	17.1
Other Devices	VPNP	Yes
	Efuse	Yes
	EDNMOS	Yes (5V)

