



IET FEMTOCELLS: PICOCHIP

May 18



Femto: Real now in many variants

Residential

Enterprise



ALU /
Vodafone



Cisco / AT&T



ZTE / CuC



Airspan - LTE



Juni



ALU /
Telefonica

LTE

SpiderCloud

Public Access



IPAccess



Contela / SKT



ALU -
Metro



Belair
3G/4G/WiFi

Enterprise

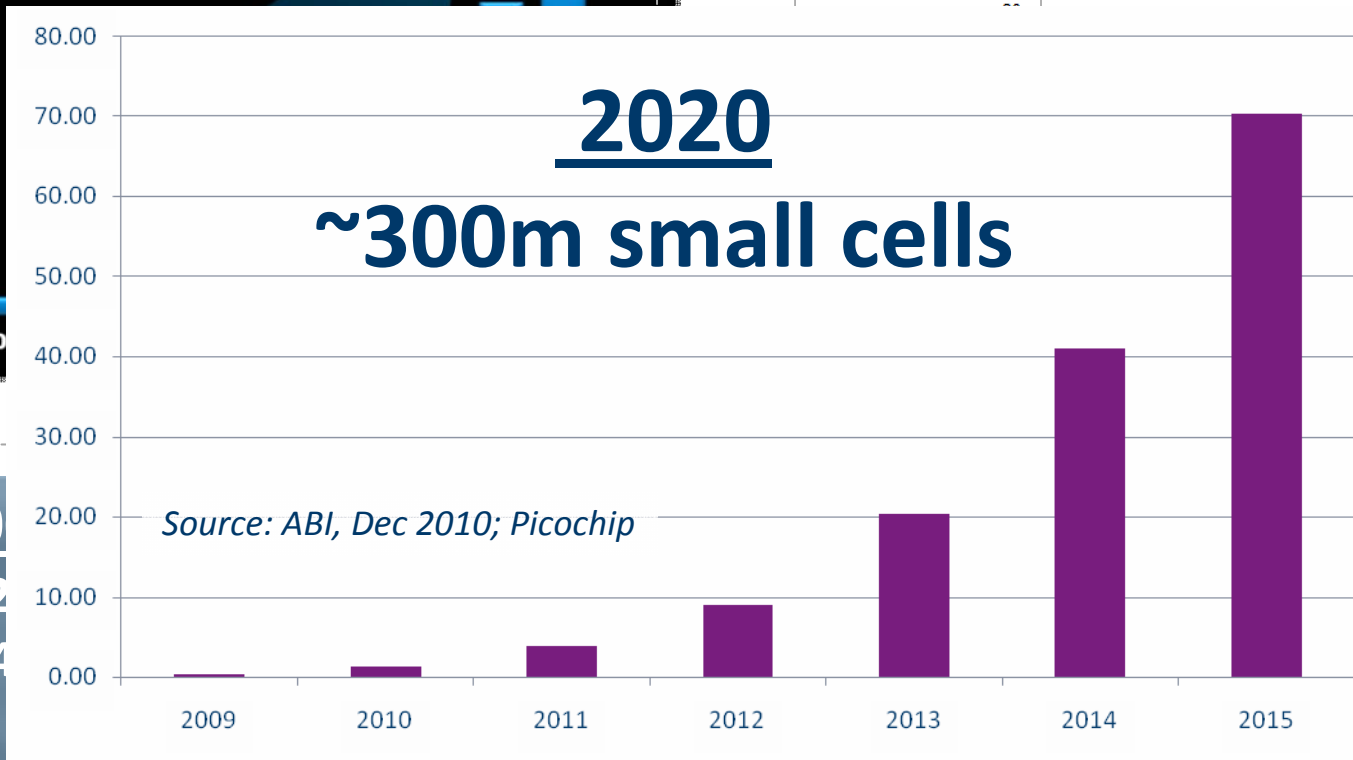
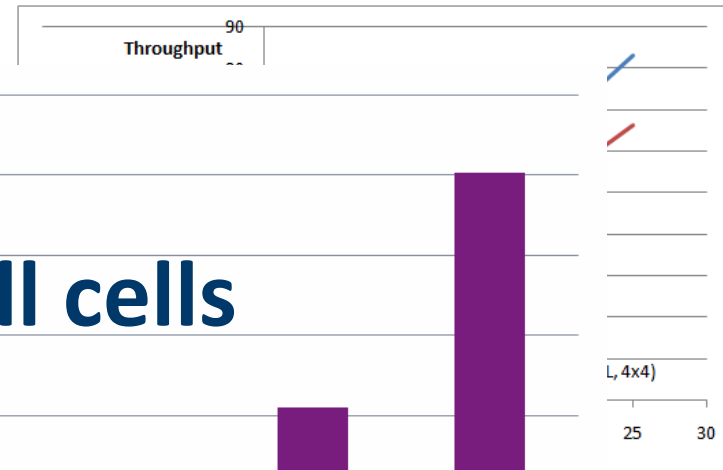




'Small Cell': Market Size 2020

1000X capacity in 10 years

Hitting Shannon bound



Source: ABI, Dec 2010; Picochip

10
2
4
>30x more cells

ells

Source: Ericsson, Sep 2010; AT&T, Feb 2011





Small Cells will be very, very big

Rural:

*27dBm+ / 2Km: 64 users+
~5m units p.a*

Metro:

*24dBm / <500m: 32-64 users
~10m units p.a*

In-Building:

*(Office | Retail | Apartments)
15dBm -> 24dBm: 8-32 users
~20m units p.a*

Residential:

*(Ethernet | G.Hn | USB | Module)
8dBm -> 15dBm: 8 users
~40m units p.a*



Example SoC

- 3GPP Release 8 (2009-03); upgrade to Release 9

- **Widest range, product for all applications**

- PC302: 4 users Residential
- PC312 8 users Residential, SME
- PC323: 24 users Enterprise, Metro
- PC333: 30/60 users LABS: Metro, Rural
- PC3008: Next-generation 8 user residential

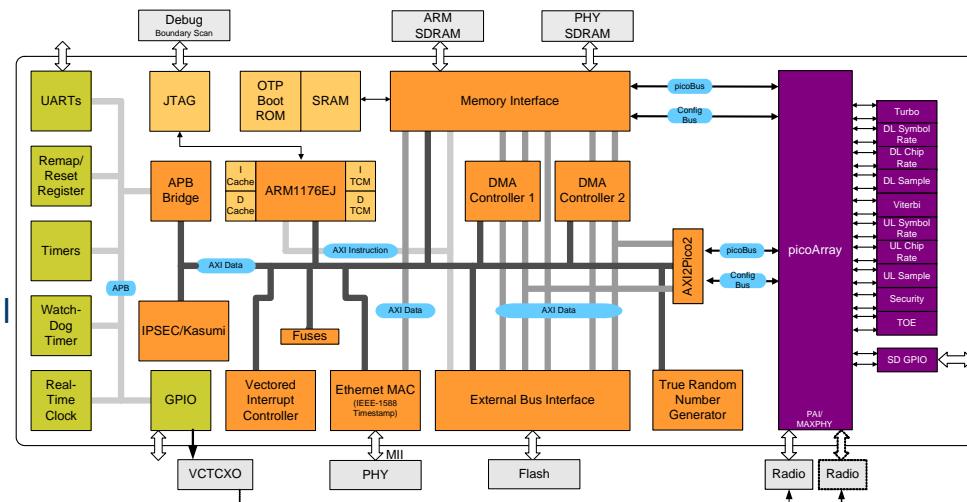
- **Lowest cost to highest performance**

- 21/28/42Mbps HSDPA performance
- 11.5Mbps HSUPA performance
- Rx diversity: Improved performance for 8+ users
- Tx MIMO: 28/42Mbps HSDPA performance (MIMO)

- **Compatible Family: seamless migration**

- **Trusted, field-proven modem**

- **Reduce risk, accelerate time-to-volume**

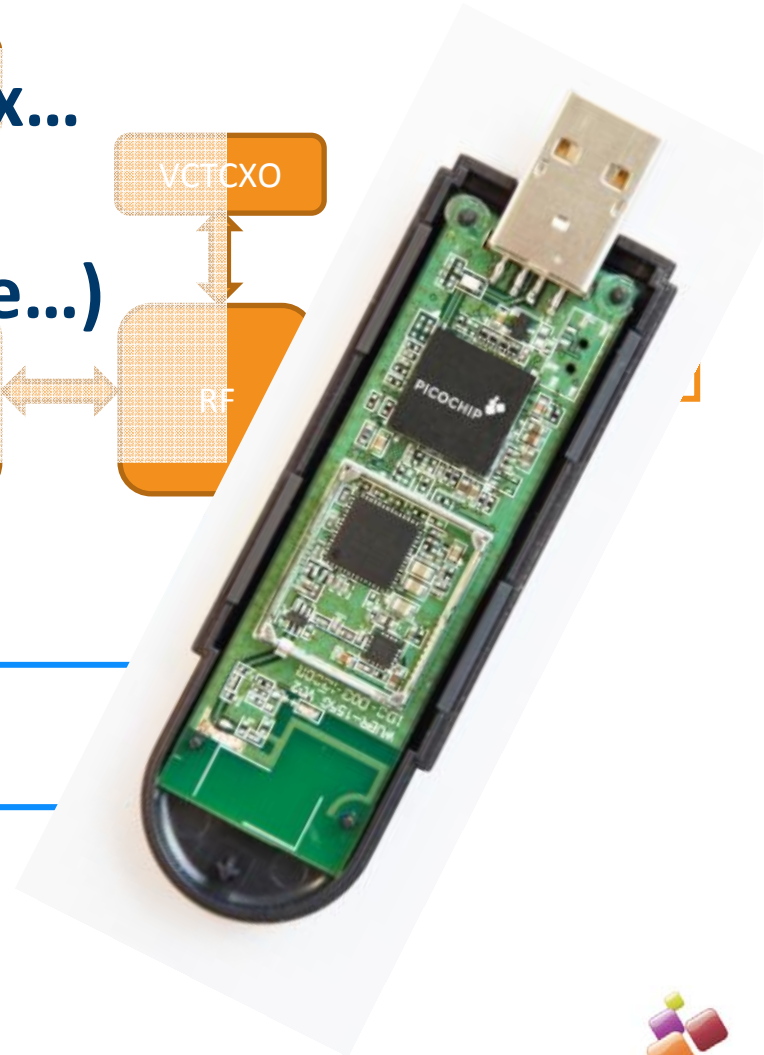
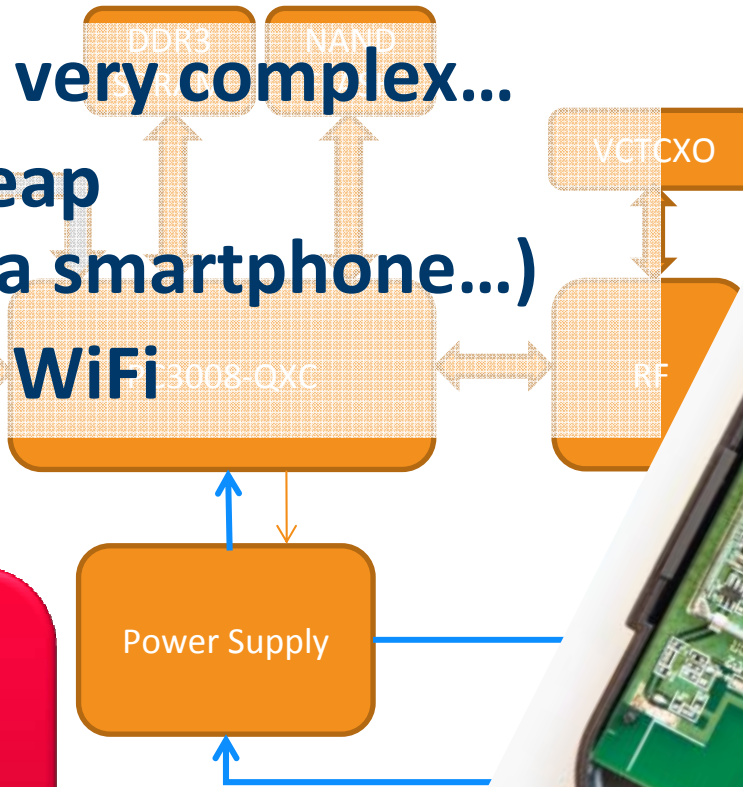


Low Cost Residential femtocell

- Femtocells are very complex...
- BUT can be cheap (cheaper than a smartphone...)

10/100 Interface

Converge with WiFi

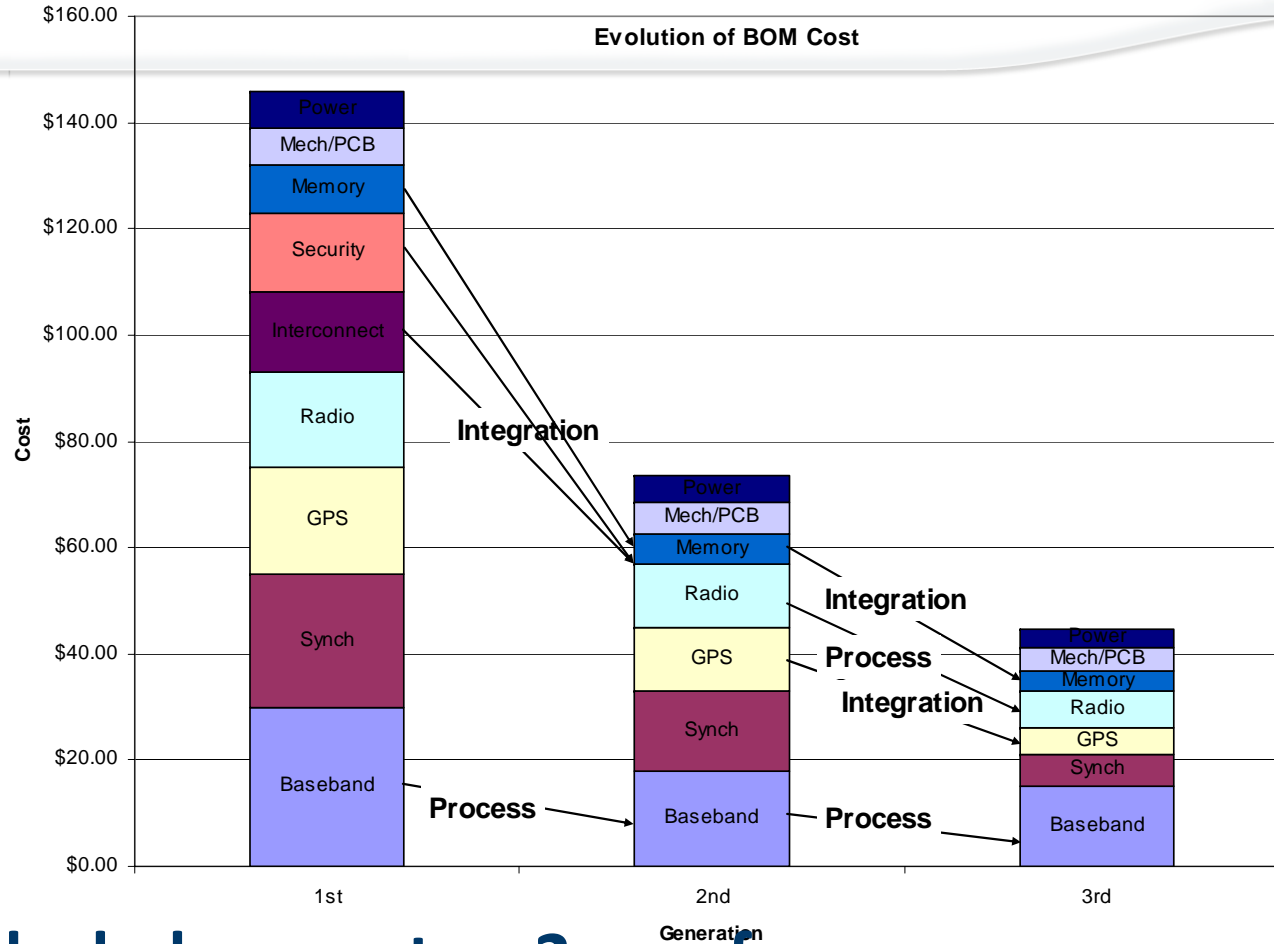


Specification

- 8 User low cost femtocell
- 21Mbps / 5Mbps
- 12*12 AQFN package
- Single external DDR3 memory
- Glueless SIM interface
- Soft GPS support
- SISO RF with ADI or Maxim RF



Moore's Law



18 months halves cost or 2x performance

Volumes of residential drive down costs of metro, rural



Femtocell

- Small Cells = Shannon's Law
+
Cooper's Law
+
Moore's Law
- Push Intelligence to the edge
- Lots of nodes = economies of scale of Silicon



- Computers have evolved ...



Mainframe



Mini-computer



Personal - computer

- Networks will evolve ...



Macrocell



Picocell



Femtocell

These are **disruptive** changes