Technology Whitepaper

Driving towards a single bill of materials for femtocells

By Ebrahim Bushehri, CEO, Lime Microsystems

In a market where standards and frequency bands are constantly being introduced, OEMs are having to introduce new products more and more quickly, simply to keep up! The average femtocell maker has to contend with 3G, WiMAX and LTE, all in different frequency bands for different locations, such as the availability of the 700MHz band in the US, for which a new transceiver, power amplifier and antenna are needed each time.

Recently, rather than starting from scratch each time, OEMs are beginning to look to programmable solutions to give them a head start. The idea is to make a small cell basestation that can be programmed to work on a different standard or at a different frequency, depending on where/how the end product will be deployed.

Baseband ICs are increasingly becoming programmable, but making a multi-band multi-standard front end has been more of a challenge.

Until quite recently it was thought the best way around this would be to use a bank of RF MEMS switches, switching between several different RF front ends, as no-one thought the RF silicon guys could do it.

However, opinions are changing as a result of companies developing programmable multi-band multi-standard transceiver ICs. For example, Lime Microsystems has recently unveiled an RF IC that can be digitally configured to operate as a WiMAX, 3G or LTE transceiver, at any frequency between 375MHz and 4GHz, with user-selectable bandwidths. Today, RF MEMS is still dogged by reliability problems, while the programmable silicon approach is offering real benefits to OEMs and system designers.

A programmable transceiver, provided it's sufficiently frequency-agile, removes the need for individual transceiver chips for each of the different standards or geographical territories. The chips can be reprogrammed rapidly and simply to function as a transceiver for various network configurations, bandwidths and data rates. This means OEMs don't have to go back to the silicon vendors each time a new spectrum allocation appears and ask for the design and implementation of yet another transceiver IC, which would inevitably impact time to market. Once a product has been developed around a particular transceiver, this maximises design reuse, again shortening the production cycle. These factors allow OEMs to quickly develop new products to meet the market need.

This is all well and good, but programmable silicon will never grab the attention of femtocell makers unless it is also competitive on cost. The words 'low-cost' and 'programmable silicon' are not usually seen in the same sentence, but if you consider the problem in broader terms than just the per-unit cost, a convincing proposition does begin to emerge.

Firstly, OEMs will be able to take advantage economies of scale, as one transceiver or baseband chip will be used in multiple product lines.

Secondly, there are also significant implications for OEMs' inventory. It will only be necessary to purchase one type of transceiver and one type of baseband chip for an entire product range of small cell basestations. This is particularly useful for global OEMs shipping to different geographical locations. So if demand goes up in one country, you already have the silicon you need, no matter which country it is.

These developments in programmable baseband and transceiver ICs are driving the small cell basestation sector closer towards a single bill of materials. This is the goal: a single end-product whose hardware can be fully reprogrammed to support any standard or frequency. We are not there yet, as power amplifiers and antennas still have a way to go, but the advantages in terms of logistical savings and time to market are apparent. It can only be a matter of time.

+++end

Further information and reader enquiries:

Philippe Roux, VP Business Development, Lime Microsystems, Surrey Technology Centre, Unit 5B, 40 Occam Road, The Surrey Research Park, Guildford, Surrey, GU2 7YG

Tel: +44 (0) 1428 653335
Fax: +44 (0) 1483 685062
E-mail: p.roux@limemicro.com
Web: www.limemicro.com

PR agency contact:

Sally Ward-Foxton, Publitek Limited, 18 Brock Street, Bath, BA1 2LW, United Kingdom

Tel: +44 (0)1225 470 000 E-mail: sally.ward-foxton@publitek.com
Fax: +44 (0)1225 470 047 Web: www.publitek.com

About Lime Microsystems

Founded in March 2005, Lime Microsystems is a fabless semiconductor company specializing in digitally configurable transceivers for the next generation of wireless broadband systems. Lime has developed broadband transceiver ICs that significantly reduce the bill of materials for small cell (femtocell and picocell) wireless networks. Working in partnership with leading baseband technology companies, the company has also produced a reference design in industry-standard MicroTCA format. Lime has development teams in the UK and Lithuania and is backed by ACT Venture Capital and DFJ Esprit. Further information is available at www.limemicro.com.