

A priority for mobile operators is improving indoor coverage and exploiting new service opportunities to compete with VoWiFi. The key to enabling this market is a low-cost 3G access point that consumers find simple to install and operate – and that, crucially, allows consumers to use their existing standard handset.

picoChip has developed both the software and the single-chip baseband processor for an HSPA access point, or 'femtocell' basestation. This enables OEMs to develop products quickly and easily, with the confidence of a fully compliant reference design.

Operator Benefits

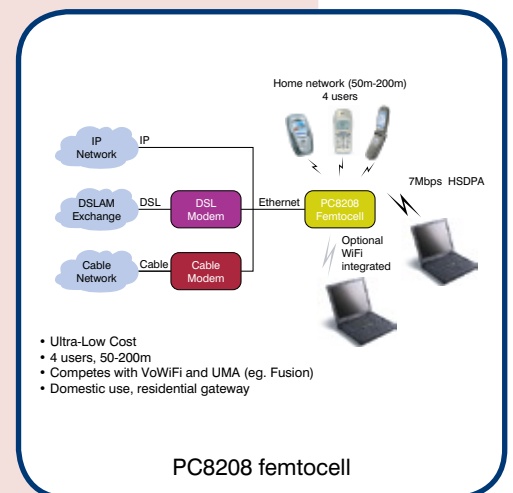
For an operator the femtocell improves coverage, counters the competitive threat from WiFi, and delivers genuine differentiation in a cost-effective way.

Offering attractive pricing to subscribers using the femtocell in the home gives operators the potential to sign up everyone in the household. Furthermore, the carrier would have the opportunity to deliver broadband bundle services as a means of reducing churn and increasing ARPU from both services.

Consumer Benefits

A home gateway offers consumers all the benefits of fixed-mobile-convergence (FMC) – in particular, the benefit of using a familiar handset for all calls, whether from home or elsewhere. However, unlike dual-mode handsets, they would have the flexibility to choose their own device from the full range on offer. In addition they might well benefit from lower tariffs within the home.

- Complete HSPA carrier-class reference designs available for fastest time-to-market
- Lowest bill-of-materials cost to enable high-volume deployment
- Also supports other standards including GSM/GPRS/EDGE, WiMAX, LTE, TD-SCDMA and cdma2000/EVDO



The PC8208 Software Reference Design

picoChip's reference design is for an ultra-low cost 3G/HSPA basestation for use in a home or small office environment, as an alternative to WiFi and UMA. The PC8208 is a complete architecture for a femtocell, supporting HSDPA with a software upgrade to HSUPA. The reference design enables an OEM to develop a femtocell with the lowest bill of materials and fastest time-to-market of any solution available today.

Such a system improves indoor coverage, reduces capex and opex and supports high data rate services. Additionally, it enables cellular operators to counter competitors offering voice-over-WiFi (VoWiFi), but – a crucial difference – allows customers to use existing standard cellular handsets.

The picoChip Node B reference design provides a modem that is fully compliant to 3GPP Rel5 2005-06 for 4 users with a 200m range, and supports 7Mb/s HSDPA. Software upgrade to HSUPA will be available later this year. The reference design includes all baseband processing (sample rate, chip rate and symbol rate operations), as well as MAC-hs scheduler, framing protocol functionality and protocol termination. Together with partners, a complete integrated and pre-tested RNC stack is available.

The PC202 processor is a single-chip implementation of all baseband operations, combining a picoChip high-performance DSP for the Node B functionality with a powerful ARM926 processor for protocol stacks (eg lub, lu, SIP or UMA).

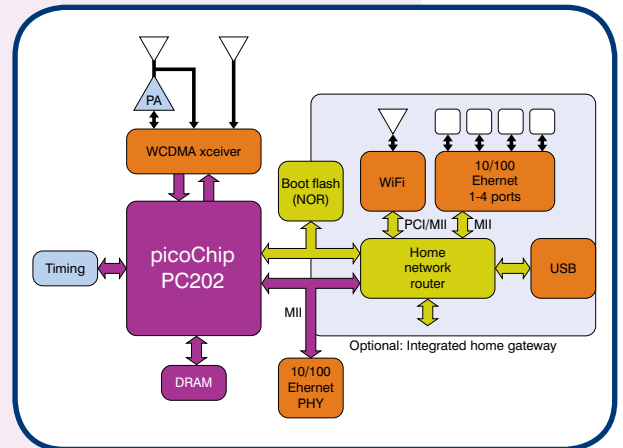
Key performance specifications

The PC8208 software has been specifically optimized for this type of solution and is inherently flexible to allow for the changing specifications of standards and as markets develop over time.

The reference design is suited to a variety of network approaches, depending on OEM and carrier requirements. For example, by running different protocol stacks in the ARM the same hardware can be used to support either traditional lub connectivity to an RNC, or alternatively a more sophisticated 'collapsed stack' approach. This has RNC integrated into the femtocell and uses SIP or UMA to connect to the core.

The femtocell can be upgraded from software, allowing a simple path for adding new features. For example,

Block diagram of femtocell or home-gateway



Parameter

Value

Standard	HSDPA (3GPP Release 5 June 05) Software upgrade to HSUPA (Release 6)
Cell Radius	< 200m
Maximum UE Speed	10km/h
Max. Traffic Capacity	4 users 12.2-384kbps CS/PS data
HSDPA Data rate	7.21 Mb/s

picoChip will be offering a software upgrade to add HSUPA functionality later in 2008.

Versatile

The logic behind femtocells goes beyond WCDMA and HSPA. In addition, picoChip also has residential access points for WiMAX, LTE, TD-CDMA, cdma2000/EVDO and GSM/GPRS/EDGE using the same architecture.

This system is software-defined and picoChip supplies the source code. This means that all the functionality can be customized, allowing OEMs to integrate their own unique features and differentiate their product from those of their competitors.

For more information contact: info@picochip.com or visit www.picochip.com/femtocells



picoChip Designs Limited
Riverside Buildings, 108 Walcot Street, Bath BA1 5BG, United Kingdom

Tel: +44(0) 1225 469744, Fax: +44(0) 1225 469767

www.picochip.com, info@picochip.com