Software Defined Radio in Mobile Phones

Description: An Analysis of the Maturing Wireless Technology Set To Disrupt the Mobile Ecosystem

With all the sophistication that characterizes today’s mobile phones, it’s easy to forget that the handset, at heart, is a radio! Traditionally, radios have been implemented entirely in hardware, with new waveforms added by integrating new hardware. However, jump forward three years and it is foreseeable that handsets sold into developed markets will need to support all of the following wireless standards: GSM, GPRS, EDGE, WCDMA, HSDPA, LTE, GPS, mobile TV, Wi-Fi, Bluetooth and UWB. Add WiMAX to the mix, as well as multi-mode handsets able to work across GSM and CDMA networks, and the number of waveforms to be supported is considerable.

Integrating additional radio hardware is impractical beyond a point because it increases the handset size, complexity and price. The attraction of Software Defined Radio (SDR) is its ability to support multiple waveforms by re-using the same hardware while changing its parameters in software. This has enormous benefits for handset size, cost, development cycle, upgrade and interoperability. SDR-enabled phones will also ease the challenges presented by limited spectrum availability and act the prefect device compliment to the network-agnostic approach of IMS.

Handset SDR is not a case of ‘if’ but ‘when’. This report presents a detailed analysis of all facets of SDR activity and forecasts the timelines and market for SDR in mobile phones.

Topics of coverage include:

- A history of SDR: the primary adopters and various initiatives
- The technologies that are likely to accelerate the adoption of SDR
- Emerging waveforms and their challenging requirements
- The commercial and business incentives pushing the handset industry towards SDR
- The technical challenges to be addressed before SDR can become mainstream
- Approaches being undertaken to address the technology and business challenges of SDR
- Analysis of the SDR patent landscape
- Discussion of the impact which SDR-enabled handsets will have on the value-chain players: from chip makers to OEMs to operators to regulators
- Forecast for the growth in SDR mobile phone shipments broken down by regions and device category

Answers and opinions are provided with respect to the following essential questions:

- How is antenna re-programmability treated in the SDR paradigm?
- What are the regulators’ attitudes towards SDR?
- What are the complexities of implementing the various mobile TV standards?
- How can the power consumption challenges of SDR be resolved?
- How will the SDR impact the positions of the big cellular IPR owners?
- What are the ‘killer technologies’ that will catalyse the advent of handset SDR?
- What are the apprehensions and hopes of stakeholders about handset SDR?
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