

# **Integrated Circuit Design for Multimedia Communications**

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The seemingly endless advancement of silicon technology has enabled the emergence of broadband communication systems for voice, data and video transmission with good connectivity and proper quality of service. Devices are being fabricated using processes managed at atomic levels while IC design involves detailed systems engineering, including the incorporation of application content. Data-rate and mobility trade-off's and different standards like 2G, 3G, Bluetooth, WLAN, GPS, digital video broadcasting and wireline technologies like ADSL and VDSL are leading to multi-mode requirements. Topics like coexistence and inter-working of these different technologies must be solved. Furthermore, secure data transfer like encryption is vital for the networked world. All these various topics are finally the reason for challenging chip design requirements such as architectural re-configurability and programmability because of the growing importance of multimode and multi-standard solutions. While parameters like data-rate and algorithmic and circuit complexity have changed approximately exponentially with time, there was not much improvement in the battery capacity. For this reason a key consideration and design challenge for mobile products is energy management and power reduction. In this context the introduction of platform concepts including analogue and RF at the most practical cost, power levels and form factors are key requirements for system-on-chip and system-in-package solutions for current and future mobile multimedia terminals.

This talk will explore current multi-million transistor IC's with multi billion operations per second of signal processing and analogue and RF capabilities for multimedia communications. It will consider special requirements on wafer processes like leakage and analogue and RF capabilities and will look at how R&D engineers bridge the world of system-level design, silicon and software and, of course, new challenges for the future will be considered and explored.