Technology network

AnSem believes that it should focus on areas where it has the highest added value and cooperate with other specialized companies in areas outside AnSem’s core competences. In the past, AnSem has collaborated with dedicated ESD developers, expert digital design houses and (analog) IP vendors to complement its expertise. Collaborative project planning with centralized monitoring and technical project management by AnSem are key to turning multi-site, multiple vendor and multiple team developments into a success. In such cases, AnSem is the single contact point managing the different teams and vendors.

About AnSem

Based in Leuven, Belgium, AnSem is a fabless IC design house founded in 1998 specializing in the development of the most advanced analog and mixed-signal integrated circuits for RF CMOS, high-speed data communication, data acquisition and ultra low-power & low-voltage applications. AnSem is a proven and solid development partner worldwide for customers requiring custom design, IP based design and full turnkey solutions.

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Experts in RF CMOS since the early days

Since its introduction more than 10 years ago, RF CMOS has proven to be an enabling technology, facilitating development of today’s multi-standard programmable transceivers. The radio transceivers for wireless networking devices and the new generation of mobile phones now being mass produced as RF-CMOS devices are a far cry from the discrete component mobile phone realizations of the 1990s. Compelled by market forces, CMOS has enabled the integration of digital processing on the same chip as the radio. RF CMOS has grown beyond zero-IF receivers and fractional-N phase-locked loops -- the newest generation of RF CMOS is, to a large extent, shaped by the digital paradigm and the boundary between analog and digital has moved forward. RF CMOS seems to continue its growth as a new paradigm for radio devices and is now taking on a more practical form in fulfilling the long-standing quest for a universal radio device which tunes or transmits any channel carrying any modulated waveform in any radio band.

Since the early days, AnSem has built up an extensive track record and expertise in RF CMOS for many different applications and markets. AnSem has the design expertise and dedicated flow to deliver consistently high quality RF design.

Successful RF CMOS product development

In order to build such complex systems on a chip (SoC), a profound knowledge that goes far beyond CMOS favorable RF architectures is required. High-end embedded ADC and DAC complete the receive and transmit chain. Advanced power management with embedded supply power conversion are mandatory for good battery lifetime. AnSem has built up extensive expertise in these different areas and has an excellent track record of successful RF SoC developments, both in consumer, (portable) communications and medical markets. Moreover, AnSem holds a unique position with its 1V RF CMOS offering that enables ultra low power wireless communication on a single cell battery.

During new developments, we engage with the customer in early chip-level exploration and even support the customer’s work by researching standards and standard compliance. Engaging in this early R&D stage of the development helps the customer make the right choices and results in risk and cost reductions. Other developments are focused on extended functionality of existing RF products that result in augmented end product or reduced costs for customers serving mature markets. Obviously, quality of work that results in high yield and ‘first time right’ developments is a key element to success.

Apart from these developments, that are typically undertaken for emerging or evolving multi-million volume mass markets, AnSem has built an excellent track record in turn-key solutions for market specific requirements, such as medical implantable devices. With these customers, we are often involved in the conceptual phase of product development and, due to our broad design and system background, we offer added value when translating very specific application requirements into feasible chip requirements that meet development time and cost requirements.

RF Design Methodology

AnSem has a dedicated methodology supported by a complete toolset to deliver the quality design needed for RF applications. For complex RF systems, AnSem developed advanced VHDL-AMS and Matlab models that allow optimization of the architecture in the early development phase and functional simulations during every phase of the design. These advanced models can be used to verify circuit performance using AnSem’s extensive library of test-benches including I/O, package or dedicated RF ESD structures, or using very system specific test-benches developed by the customer. This comprehensive top-down bottom-up design methodology results in reduced development risk even for very complex or large systems. Digital design can be co-simulated and, as is often the case, external (analog) IP can equally be included in system verification.

For RF core building blocks, a harmonic balanced simulation tool and advanced interconnect and RF device model are used to allow in-depth analysis and qualification of typical RF block designs such as synthesizer, LNA or mixed circuits. Complemented by finite element simulations for on chip inductors, these tools allow fast delivery of RF block design.

Some other RF CMOS realizations

• Fully integrated GPS receiver
• DECT synthesizer
• Bluetooth IP base-band section
• Various fully integrated ISM transceivers
• FM receiver for hearing aid
• ANS1601 ultra low-power CMOS ISM RF transmitter
• Home Networking

Your analog connection to the real world