WiMAX and LTE: Closer than You Think

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After three years of deliberation, the IEEE802.16m air interface definition will be ready for prime time in the next few months. This critical step toward creating true 4G cellular technology based on WiMAX is important enough to earn compliant products a new name: WiMAX 2.

Further proof came last month, when an impressive subset of the WiMAX community created the WiMAX 2 Collaboration Initiative to "improve the economics of mobile broadband" and "to create a better value chain for service providers."

In the U.S., service providers have been in a hurry to reinvent their infrastructures to support 4G. Sprint has partnered with Clearwire to roll out WiMAX-based services, while Verizon is basing its network enhancement plans on another mobile broadband technology: LTE. It's a safe bet that these players would like to see some harmonization between WiMAX 2 and LTE, and take advantage of any economy of scale provided by the availability of standard equipment.

WiMAX and LTE both use OFDM signaling and are similar enough for baseband chip vendors to state confidently that they have chips that can handle either standard. That leaves the RF solutions providers to join the harmonization party, but the many wireless frequency bands and varying power requirements make this easier said than done. SDR (Software Defined Radio) in one of its many flavors may be the answer for the radio chip.

Power amplifiers and filters, on the other hand, have a difficult balancing act to perform. Tradeoffs between operating bandwidth and power efficiency drive decisions regarding which and how many frequency bands to support in a particular product. And disparities in the transmit power levels between WiMAX and LTE beg the question: under which conditions should one optimize PA performance?

ANADIGICS is a leader in providing PAs for both WiMAX and LTE, and in developing multi-chip modules that integrate multiple PAs, covering the most appropriate frequency bands for a particular geography or application. Our experience indicates that PAs optimized for WiMAX will support LTE signals as well, and our BiFET process enables the design of PAs which can support both WiMAX and LTE products without compromising key performance.. But as LTE and WiMAX usage models are refined, will they lead to a common set of highly-optimized performance traits? Or will multi-mode capability be a requirement for PAs that support both standards?

Much like any new technology deployment, 4G performance is - and will continue to be - a moving target. As system requirements evolve and the carriers clearly identify their 4G needs, semiconductor companies will have to continue to adapt.

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