Wireless Communication Products means a System-On-Chip with RF Headaches for Testing. Where is the Miracle Pill?

Mustapha Slamani
IBM Microelectronics
RF/Analog Group, Test Development,
1000 River Street, MailStop 862G
Essex Junction, Vermont, 05452

Currently, wireless communication product is an ensemble of analog and digital, as well as RF parts, on the same chip. One chip in a hand set cellular phone includes: an I/Q modulator and demodulator, low noise amplifiers, filters, DAC, ADC, a gain controller, PLL, amplifiers and a digital signal processing block. When testing these parts, we face the complexity of a system-on-chip and the challenges of high frequency.

Numerous problems are encountered during test development of these products. No existing test instruments are optimized, for present wireless communication products, to ensure concurrent flexibility in digital programming, accurate analog measurement and efficient RF testing. Utilizing these testers, no RF test can be approved without the use of test bench equipments (spectrum analyzer, noise figure meter, vector analyzer and power meter) to confirm the tester. Many other problems slow the test development cycle and affect the test quality. These aspects include the complexity of the test board design and layout, the packaging, and the performance of the socket. Design for manufacturability is one of the mean keys that help to improve the test efficiency, test development cycle and reduces time to market. Design for test at the chip or board levels is a very desired solution to help measuring very aggressive specifications like IP3 of high linear products. Furthermore, the cost of test hardware is another obstacle in testing these products.

This panel, comprised of wireless communications test engineers, design engineers and test equipment manufacturers, will discuss the potential problems and solutions, in order to minimize test cost and development time, for the next generation of these products. It also will search for a miracle pill to remedy these problems.

Moderator: Mustapha Slamani, IBM
Panelists:
Mark Roos, Roos Instruments
Chris Giovanniello, Teradyne
Jayendra Bhagat, IBM
Gordon Roberts, McGill University
John Barr, Agilent Technologies