**INTEGRATED CIRCUIT TESTING**

**ABSTRACT**

Over the years of its development, the integrated circuit technology has brought great progress to the design of high performance systems. Many challenges in the manufacturing process had to be solved to achieve this. One of the steps in this process, namely testing, is posing the most significant challenge to contemporary and future integrated circuit (IC) manufacturing. This is a continuing trend, because due to decreasing silicon cost and increasing complexity of integrated circuits, testing constitutes a very sizable portion of the IC manufacturing cost. This trend is further accentuated by the emergence of mixed signal, including radio frequency (RF) circuits, coupled with the competitive price pressures of the high volume consumer market. Frequently, the cost of testing a chip with a CODEC,1 an integrated digital signal processor (DSP), and other base-band circuitry reaches 30 to 50% of the

total cost.

Integrated circuit (IC) testing for quality assurance is approaching 50% of the manufacturing costs for some complex mixed-signal IC’s. For many years the market growth

and technology advancements in digital IC’s were driving the developments in testing. The increasing trend to integrate information acquisition and digital processing on the same chip has

spawned increasing attention to the test needs of mixed-signal IC’s. The recent advances in wireless communications indicate a trend toward the integration of the RF and baseband mixed signal technologies. In this paper we examine the developments in IC testing form the historic, current status and future view points. In separate sections we address the testing developments for digital, mixed signal and RF IC’s. With these reviews as context, we relate new test paradigms that have the potential to fundamentally alter the methods used to test mixed-signal and RF parts.