Examinator Case Study: RF IC Characterization at Quorum Systems

Background

Based in San Diego, California, Quorum is a fabless semiconductor company focused on developing highly integrated single-chip radio frequency (RF) transceivers that enable multi-band, multi-mode communication. At the forefront of semiconductor technology in the EDGE, Wi-Fi and 3G markets, Quorum Systems is dedicated to developing the core technology that will enable high performance communication.

Test Challenges

Simply put, Quorum develops the RF CMOS ICs that make up the front-end (which connects to the antenna) of cell phones and other wireless devices. Needless to say, this is a huge, highly competitive market with potential volumes of hundreds of millions of devices. Before committing to large-scale production of a new IC, Quorum engineers must perform exhaustive characterization of the chips to ensure that they comply fully with the wireless standards, perform to spec under a wide range of process variations and operating conditions, and are manufacturable with adequate yield. Quorum relies on Galaxy Examinator to perform this critical step in their design-to-manufacturing process.

PVT+Frequency Characterization

Once the initial engineering samples come back from the foundry Quorum engineers perform a wide array of corner-case tests on them using a sample size of a few thousand parts. Devices representing fast, nominal and slow process parameters are subjected to multiple combinations of operating voltage, temperature and frequency, resulting in many megabytes of test data.

Quorum uses a combination of ATE (LTX CX) and lab instruments to perform the testing and then loads all the data into Examinator for extensive distribution analysis. Quorum engineers rely heavily on Examinator's powerful scripting capability since they need to launch dozens of runs that examine the effect of process and operating variations on the test results. It takes less than 3 minutes to analyze hundreds of thousands of test cases and produce a comprehensive 143 page report.

Quorum's Results Using Examinator

Using Examinator, Quorum engineers were able to isolate a number of temperature and frequency-related design issues and reduce the number of costly respins. In addition they were able to optimize their test process and ensure that their manufacturing yields would meet expectations.

What Quorum Especially Likes About Examinator

Quorum was especially impressed by the robustness of Examinator's STDF reader, which accommodates the subtle format variations from different ATE systems. They also like the powerful scripting capability, which saves them hours of mouse-clicking. And last but not least, they are very pleased with the feature set and the value of the tool for the price they paid.

The Bottom Line

"With Galaxy we were able to perform all of our characterization tasks at a fraction of the cost of competing packages. We are very happy with both the product and the support."

B. Pugh, VP Operations, Quorum Systems