Agilent 93000 SOC Series RF Measurement Suite

Product Note

- **Increase throughput with FAST test times**
- **Improve yield with accurate and repeatable measurements**
- **Speed time to market with simple DUT board designs**

Agilent Technologies

The Evolving Wireless Market

In today's volatile wireless market, the only constant is change. Technology is rapidly evolving to provide more data faster to meet the demands of mobile consumers.

A multitude of new Cellular standards (2.5G and 3G) for mobile phones are emerging. These new formats will provide higher data rates and increase the capacity of cellular infrastructures. But their deployment plans continue to change – making it difficult to predict what the market will demand next.

Bluetooth™ is showing up in consumer appliances, but the standards continue to evolve – adding more functionality and interoperability. In addition, faster data rates and higher frequencies are likely changes for future Bluetooth standards.

WLAN is also growing in popularity. As in Bluetooth and cellular, new standards continue to arrive. With these new standards, both higher data rates and higher frequencies are specified. With existing standards evolving and new standards arriving, it is unclear which will be implemented and when, demanding a solution that is ready for a rapidly changing market.

The Leading Solution for Wireless Test

With over 10,000 employees focused on technology for the wireless communications market, Agilent is the number one provider of wireless test solutions. As the RF test technology leader, Agilent brings high frequency expertise to the proven Agilent 93000 SOC Series platform.

The RF Measurement Suite for the Agilent 93000 is based on the test technology used in the industry leading Agilent 84000 RFIC Series, which is known for its accurate and repeatable RF measurements.

RF Measurement Suite

The Agilent 93000 SOC Series with RF Measurement Suite can test a range of wireless applications - including:

- Bluetooth
- Cellular/PCS
- WLAN

The RF Measurement Suite (Figure 1) provides:

- Up to 12 RF Ports
- 8 GHz Modulated Stimulus
- 8 GHz Measure
- Multiple Tone Stimuli
- Frequency Hopping
- Bit Error Rate (BER)

With the RF Measurement Suite, a robust set of measurements is available (shown in Table 1).

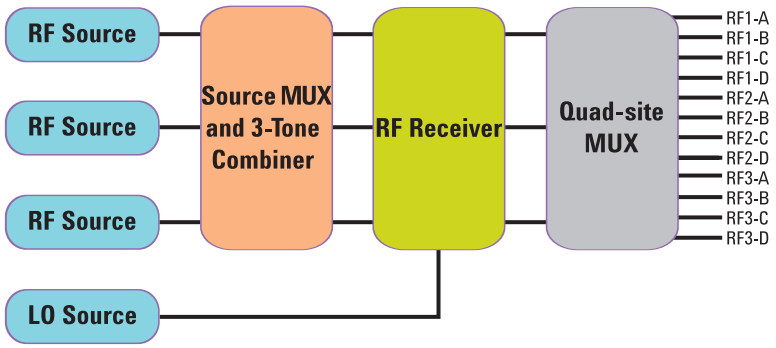

Figure 1. Block Diagram of the RF Measurement Suite

- Input Power
- Output Power
- Modulated Output Power
- Gain
- Gain Compression
- Isolation
- Conversion Gain
- Leakage
- Efficiency
- Harmonic Distortion
- Intermodulation Distortion
- Spurious Signals
- Frequency
- Modulation Characteristics
  - Frequency Settling Time
  - Frequency Drift
  - Frequency Deviation
- Phase Noise
- Bit Error Rate

Table 1. Available Measurements

Reduce Your Cost of Test

The RF Measurement Suite significantly reduces cost of test with:

- Real-Time RF Data Processing
- Real-Time BER Measurements
- Fast Switching Sources
- Simple DUT Board Designs
- Quad-Site Test

Real-Time RF Data Processing

The unique, real-time RF data processing architecture of the RF Measurement Suite allows data manipulation and comparison in the DSP of the RF receiver, avoiding time consuming downloads of data into the host computer.

Real-Time BER Measurements

BER Measurements can be made in parallel on up to four devices under test (DUTs) using digital channels specifically designed for BER measurements, minimizing BER test times and ultimately device test time.

Fast Switching Sources

Test time reductions can be realized with the fast switching sources used as the RF Measurement Suite's primary RF source and system LO source. The fast power level and frequency switching allows significant test time reduction in power, gain, harmonic, and intermodulation measurements. Also, the fast switching sources enable the frequency hopping capability of the RF Measurement Suite.

Simple Dut Board Designs

Cost reductions are realized as a result of simple DUT board designs. All RF components, such as splitters, switches, combiners, amplifiers, and attenuators, are built into the test system, not on the DUT board, reducing both cost and development time for new DUT boards. Simple DUT boards increase repeatability of the test system, ensuring better tester-to-tester and tester-to-bench correlation, while also increasing system reliability to minimize downtime.

Quad-Site Test

The RF Measurement Suite can support up to quad-site test (a DUT board example is shown in Figure 2), ensuring the highest throughput. In addition, you can be assured of accurate and repeatable measurements from site-to-site with this time-proven RF technology.

Accurate and Repeatable Measurements

The RF Measurement Suite provides the ultimate accuracy and repeatability with its:

- RF Interface
- Calibration

RF Interface

The RF Measurement Suite offers a robust RF interface ring (shown in Figure 3) for connections between the DUT board and test system. The RF interface utilizes Agilent's patented Blindmate connectors to provide quick connects and disconnects of fixturing to the test head while maintaining excellent reliability and repeatability.

Calibration

The calibration plane of the RF Measurement Suite is at the Blindmate connectors of the RF interface. As previously noted, all of the RF components are built into the system, and not on the DUT board. As a result, the effects – loss and mismatch – of these components are calibrated out. This, together with our patented Blindmate connectors and time-proven calibration algorithms, provides the ultimate in accuracy and repeatability.

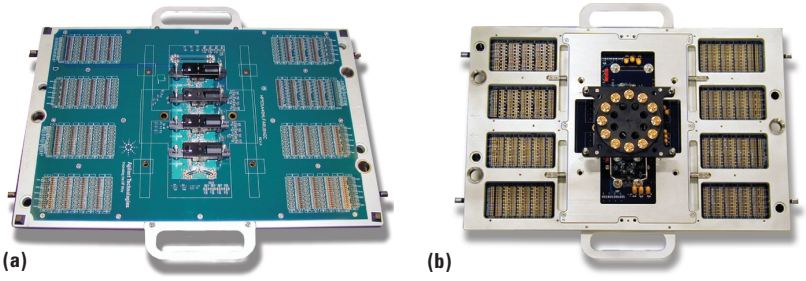

Figure 2. Quad-Site DUT Board (a) Top View (b) Bottom View

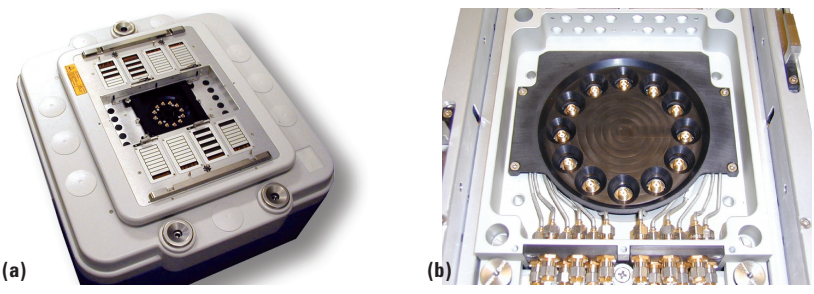

Figure 3. (a) Test Head with RF Interface (b) RF Interface

The Single Scalable Platform

The RF Measurement Suite is available on all models of the Agilent 93000 SOC Series. The 93000 single scalable platform has the widest application coverage in the industry, reducing the number of platforms required on your production floor, which minimizes operating expenses and maximizes work-force flexibility. The flexibility of the 93000 allows you to configure a single system to test several different devices, maximizing tester utilization and reducing overcapacity. The scalability allows you to configure the 93000 to meet your specific performance and economic requirements, minimizing capital cost while maintaining 100% compatibility across configurations, and keeping the ability to upgrade in the future. The scalability and flexibility of the Agilent 93000 SOC Series allows you to stay competitive in the fast paced wireless market.

The Intelligent Choice...

When Agilent's wireless test expertise is combined with the Agilent 93000 SOC Series platform, you get the ultimate test solution for wireless SOC chips. A test solution with all of the benefits of the lowest cost, single scalable platform. Plus, the assurance of meeting your challenging test requirements today – and in the future.

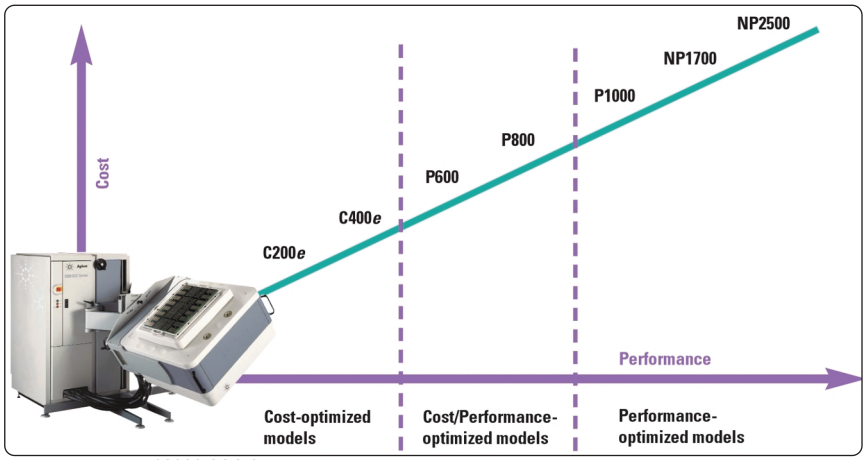

Figure 4 . Agilent 93000 SOC Series Family Diagram

RF Characteristics

RF Source Frequency	10 MHz to 8 GHz (Modulated and CW)
RF Measurement Frequency	10 MHz to 8 GHz (Scalar)
Multiple Tone Stimulus	2 or 3 Tones; 500 MHz to 3 GHz (2 Mod or 2 Mod + 1 CW)
Frequency Hopping Source	100 usec Hopping Time; 20 MHz to 3 GHz
Modulation Formats	CW, GFSK, CDMA, NADC, GSM, TETRA, PHS, PDC, DECT, WCDMA, cdma2000, EDGE
IF Bandwidth	10 MHz
RF Ports	3 to 12

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