

BACKGROUND



Verigy Port Scale RF

The New Standard for Testing Next-Generation Devices

The Port Scale RF solution for the Verigy V93000 SoC Test Platform delivers the cost-effective, reliable measurement capability required to test emerging 3G, 4G and high-integration semiconductor devices containing multiple RF radios, mixed signal, digital, power management and embedded or stacked memory – all with one test system.

Delivering Lowest Cost-of-Test with Scalable, Parallel RF Test

The Port Scale RF solution meets the challenging requirements of the 3G/4G market with these unique capabilities:

- High throughput RF measurements and industry-leading multi-site efficiency, due to parallel RF source and measure capabilities. Previous generations of RF-SoC ATE offered one RF receiver multiplexed to many RF ports, resulting in inefficient, serial multi-site test. Port Scale RF offers up to 8 parallel RF receivers for true parallel test, so four devices can be tested in parallel AND two RF ports on each device can be tested concurrently, or up to 8 devices can be tested in parallel, for industry-leading throughput and multi-site efficiency. Port Scale RF's architecture can extend to even higher port counts, should the need arise in the future.
- Scalable, parallel RF test for industry-leading throughput at the lowest cost. Port Scale RF can be configured with 12 to 48 RF ports to handle the increasing complexity of multiple radios integrated into a single device, and to enable multi-site testing of these highly integrated devices while maintaining the ability to scale down for low-cost testing of low-integration RF devices. With Port Scale RF, RF ports can be scaled to meet device and parallel RF test requirements at the lowest cost, providing the right test choices for today's device mix.
- Proven performance, repeatability, and stability for improved device yields and quality of test with the industry's lowest noise floor (-161 dBm/Hz). Port Scale's performance and accuracy meets the demands of next-generation devices with fewer acquisitions and less averaging, resulting in faster measurements.

Significant Throughput Improvements with Faster Test Times and Greater Multi-Site Efficiency

Test cell throughput and multi-site efficiency have the highest impact on cost-of-test (COT), even more than capital cost. The V93000 Port Scale RF architecture makes key contributions to lowering COT by improving the overall test throughput.

This is accomplished by reduced test times and highly efficient multi-site testing of RF devices.

The Port Scale RF solution provides faster test times due to key architectural advantages:

- Fast source frequency and power level changes
- Sequencer grouping which enables multiple RF measurements in a single execution
- Industry's lowest noise floor (-161 dBm/Hz), resulting in fewer acquisitions and less averaging
- Low overhead multi-site testing, resulting in high parallel efficiency for multi-site testing

Port Scale's greater multi-site efficiency is also due to key architectural advantages:

- Up to 8 parallel RF receivers for simultaneous, parallel RF measurements on multiple RF ports of one device and/or multiple devices under test. Each Port Scale system can be configured with up to 48 RF ports – 16 parallel source ports and 32 source/receive ports multiplexed to the 8 parallel RF receivers. Unlike other RF ATE that rely on multiplexing to achieve high RF port counts, Port Scale offers more than just multiplexing with its 8 parallel RF receivers.
- Hardware DSP in each RF receiver on the MB AV8, enabling simultaneous parallel calculation of RF measurements
- Ability to source multiple RF signals in parallel to multiple devices under test

Proven Performance and Stability with the V93000 Platform

The Verigy V93000 SoC Test Platform offers the widest application coverage in the industry, handling the latest generation devices that contain, for example, hi-fi quality audio, video capability, RF and high-speed digital interfaces. With over 1500 test systems installed worldwide, the V93000 is a proven platform, well-known for its high performance, repeatability, accuracy and stability.

The V93000 single scalable platform increases efficiency, which is critical to lowering cost-of-test and speeding time to market. The wide application coverage results in unprecedented asset utilization and manufacturing flexibility. Engineering time is reduced through test program reuse and the limited training requirements that result from a single, familiar test system across the product lifecycle. Additional efficiencies are gained from the consistent software platform, the same hardware modules from one system to the next (Pin Scale digital, analog, RF, etc.) in a choice of compact, small or large testhead, DUT board reuse and use of the same docking hardware and positioning, which results in a consistent prober and handler setup on the test floor.

Industry-Leading Throughput: Port Scale RF provides parallel RF test with up to 8 parallel receivers for industry-leading multi-site efficiency, resulting in significant throughput improvements over previous generation RF ATE.

Scalable, Parallel Test: Port Scale can scale up to test high-integration devices in parallel AND, unlike other RF ATE, it can scale down to 12 RF ports to test low-integration devices in parallel, enabling industry-leading throughput at the lowest cost.

Unmatched Performance: With the industry's lowest noise floor (-161 dBm/Hz), Port Scale offers the performance and accuracy demanded by next-generation devices with fewer acquisitions and less averaging, resulting in faster measurements.

Port Scale RF enables today's cutting-edge RF device suppliers to test their most complex 3G, 4G and high-integration devices in parallel, resulting in the lowest cost-of-test. With its parallel RF test capability, Port Scale RF easily doubles the RF multi-site efficiency of previous generation RF ATE, delivering greater than 85% quad-site efficiency. Port Scale RF's industry-leading parallel RF test and proven performance are key reasons why eight of the top ten RF semiconductor suppliers are using it today.

The V93000 Port Scale RF is the first ATE system to provide multi-port RF test capability fully integrated into the testhead for maximum performance. Verigy incorporates the industry's highest functionality per square centimeter on single-slot cards for a testhead, enabling smaller tester footprint, lower cost and maximum functionality. This high level of integration has enabled Port Scale to offer an industry-leading 8 parallel RF receivers, resulting in superior multi-site efficiency and significantly lower cost-of-test than previous generations of RF ATE systems.

Rapid Customer Adoption

Within the first four months of Port Scale RF solutions availability, there were already more than 25 customer devices being developed on Port Scale RF for production release. These include the most challenging new 3G, 4G and high-integration devices, as well as existing 2G applications, including:

- CDMA2000
- WCDMA
- MIMO/802.11n WLAN
- Wi-Max
- UWB
- DTV/Set-Top Box
- RF SoC and RF SIP, which integrate RF with high pin count digital, analog, power management and memory
- High-integration RF devices, which have multiple radios including multi-band cellular, WLAN, Bluetooth, GPS navigation and more
- Current technologies, including GSM/CDMA, EDGE, EV-DO, Zigbee, CATV/satellite tuners and more

As of October 2007, eight of the top ten RF semiconductor suppliers (as listed in iSuppli *Wireless IC Market Share Report*, May 2007) were using Port Scale RF and dozens of Port Scale RF solutions had been shipped to customers who together represent approximately two-thirds of the RF/IF IC market. Port Scale RF is the only fully integrated ATE solution qualified for high volume manufacturing of 3G, 4G and high-integration RF devices. Just four months after its introduction, Verigy's Port Scale RF solution was already gaining widespread market acceptance and becoming the new standard for testing next-generation devices.

There is a worldwide installed base of over 1500 RF-ready V93000s. This allows upstream design houses and integrated device manufacturers (IDMs) to meet the aggressive ramps required to secure time-to-market for new designs. It also enables them and their outsourced semiconductor assembly and test (OSAT) companies to realize even greater return on investment by simply upgrading their existing V93000 systems.

#