Fast Measurements
in Power Amplifier Test

Submitted by [Keysight Technologies](#)

A vital portion of RF power amplifier (PA) test is the need to quickly generate a stable voltage and measure a resulting current. Current measurements are used by design and test engineers to determine PA efficiency. The ability to set a stable voltage and measure current in a very short time is key to minimizing PA test times, which can be critical in certain applications. For example, in a cellular production application, PAs process through an automated test environment (ATE) in a few ms. Longer test times can be very costly because the volumes are 100 million or more. Fast R&D PA test times are not as critical, although, faster test times are valued.

In an RF PA test application, the supply is typically only varied over a small range. However, current will vary quite a bit depending on the driver level, modulation, frequency and so on. This means that for nearly every test point an accurate V/I reading is needed. The ability to measure a wide range of current is required to cover the PA operation needs. For example, during test times when the PA requires a high drive configuration, current will need to be measured in amps. When the PA is in a low drive or sleep configuration as little as uA will need to be measured.

Bandwidth and voltage or current settling in a PA test are very important because the source and PA can oscillate in certain power supply response conditions.

Source/measure units (SMU) are designed for sourcing and measuring both voltage and current for test applications. A PXIe high-speed PXI SMU is an ideal instrument for use in RF PA test, as it provides a voltage source, current source, ammeter and voltmeter in a single-slot PXI module. An SMU provides faster test throughput by changing a source voltage, stabilizing and making a measurement all in a very short time (ms). Some SMUs are also highly useful for making accurate µA leakage current measurements.

For more details on the PXIe SMU, see www.keysight.com/find/m9111a. For information on PA test solutions, see www.keysight.com/find/solution-padvt