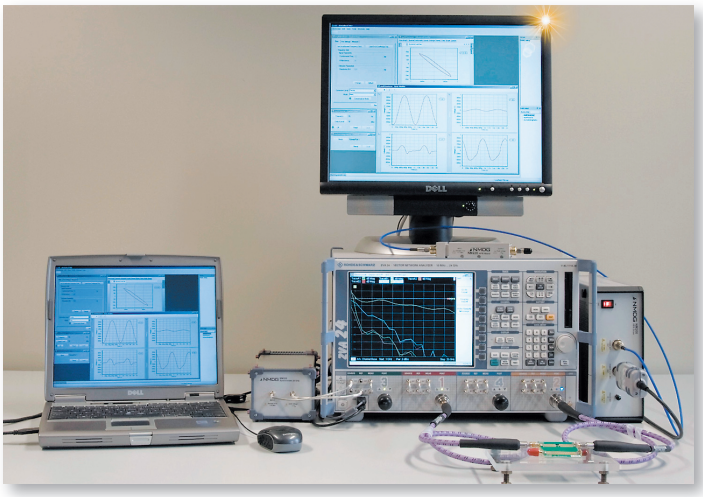
VNAs characterise nonlinear HF components in time domain



With NMDG extension kits for vector network analysers the user can characterise the nonlinear behaviour of HF components in time and frequency domain under realistic conditions, even in a non-50 Ohm environment. The NMDG NM300 extension kit support respectively the ZVA and ZVT Network Analysers from Rohde & Schwarz. This kit is a software/hardware combination, enabling the VNA to characterise in time and frequency domain the harmonic behaviour of high-frequency components, including diodes, transistors, power amplifiers etc. On top of the standard measurement capabilities of the R&S ZVx models, these kits provide calibrated measurements of the time waveforms of the incident and reflected waves or voltages and currents at the ports of a component under test. The kits cover a frequency range from 600 MHz to 20 GHz. The measurements are performed under realistic conditions, possibly including a non-50 Ohm environment using passive or active tuners.

Amongst others, the software allows to superimpose the dynamic load line under large-signal conditions on the static DC-IV curves of the device under test, assuming the proper DC instrumentation is present. Using passive tuner technology or using fundamental and/or harmonic active tuning techniques, it is possible to study the behaviour of the component in a non-50 Ohm environment.

All the software runs on a desktop computer or a laptop. With an easy-to-use graphical user interface, the user configures and calibrates the system to perform accurate harmonic measurements. Measurement data can be saved in different data formats and are directly usable in common CAE software.

For power applications, the versatile software and hardware allow the use of four external couplers in combination with programmable step attenuators, connected to the input of the receiver channels of the R&S ZVx. By extending the ZVx, one can finally see in reality the nonlinear behaviour of components. This is very powerful as diagnostics tool to understand what to do to meet the design specifications. Breakdown effects under realistic conditions are completely demystified. Models can now be verified and tuned with complete and accurate measurements, corresponding to more realistic situations. By eliminating the uncertainty of model quality, the design process is accelerated. Enabling waveform engineering, optimal performance for power amplifiers can be achieved.

▶ *NMDG NV*
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