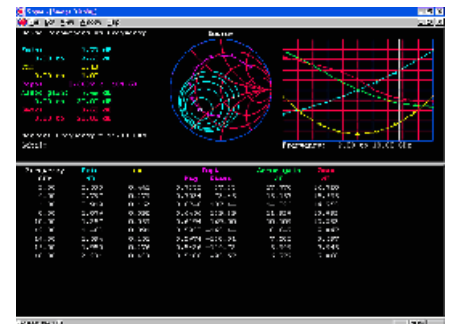


# Noise Parameter Measurements

The noise figure of a transistor depends on the impedance of the source as the transistor sees it. A set of 3 noise parameters per frequency (minimum noise figure,  $F_{min}$ , complex, optimum source impedance or reflection coefficient  $\Gamma_{opt}$  and specific noise resistance  $R_n$ ) fully describes noise figure as a function of source impedance. A typical noise parameter measurement setup utilizes this dependency by measuring device noise behavior at various, known source impedances and calculating the above noise parameters from that data. Adjusting the source reflection coefficient is done with a so-called 'tuner' or variable impedance transformer.



## Tuner Systems

Maury Microwave Corp. offers different types of tuner systems for your noise parameter measurement setup.

A range of electronic tuners (0.3-40GHz) is ideally suited for extensive on-wafer device measurements because they are light, small and very fast. Their design and accompanying software is optimized for the complete device characterization process, including S-parameter measurements, over the entire wafer.

A series of mechanical tuners (coaxial and waveguide), cover an extremely broad frequency range (0.25-110GHz) and have high impedance transformation range (VSWR 1:>30). Although at first glance perhaps less suited for on-wafer applications, they are very versatile components for packaged device noise parameter measurements and also for load-pull power characterization.

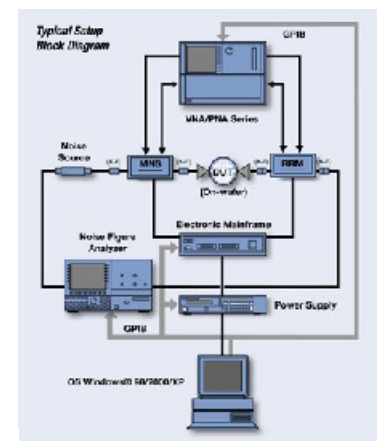
Both the electronic and the mechanical tuners are controlled by the measurement software. This package guides the user through calibration of the setup, directs the measurement and displays data in various graphical representations. A list of examples and templates helps you customize the software in case its long list of features and supported instruments are not yet complete.



## Noise Parameter Measurement Setup

A typical noise parameter measurement setup consists of the following major components:

1. Tuner system and Measurement software  
These are the key-components, determined by your application: Frequency and impedance transformation range, weight/size, flexibility, support
  2. Contacting solution  
Ask us for on-wafer probing and characterizable fixtures for packaged devices.
  3. Equipment  
We help you specify new equipment and your existing equipment.
- Our service also includes on-site installation and training of end-users (classroom and hands-on).



BSW TestSystems & Consulting AG and Maury Microwave Corp. are both **Agilent Technologies** Channel Partner

## Contact Information

BSW TestSystems & Consulting AG  
Oskar-Messter-Strasse 12  
85737 Ismaning  
Germany

Tel + 49 (0)89 960574-0  
Fax + 49 (0)89 960574-11  
e-mail info@bsw-ag.com  
Internet www.bsw-ag.com