Software Speeds Load-Pull Testing

Numerous functions, such as fine tuning and gradient peak-search capability, have been added to Windows-based load-pull measurement software.

LOAD-PULL measurements are instrumental when determining optimum impedances for matching transistors to input and output networks in high-power amplifiers. In order to simplify these measurements, Version 6.0 of the WinPower program from Focus Microwaves, Inc. (Ville St. Laurent, Quebec, Canada) provides full automation of the company's precision impedance tuners from a Windows-based personal computer (PC).

The load-pull software is written for Windows 95 and Windows NT operating systems. It offers all features of the company's DOS Version 5.2, such as gradient peak search and fine mouse tuning, as well as a host of new features, including full control of the company's load-pull impedance tuners, full macro file operation and macro file editor, a design window with the ability to set plus/minus tolerances, a configurable tool box, full on-line help, a user-defined "figure of merit" function, along with support for Hewlett-Packard "VEE" and National Instruments' LabView software drivers. Additional features include integrated harmonic-tuner operation, the capability for establishing multiple measurement lists, as well as plotting of current-voltage (I-V) curves with automatic bias adjustments.

WinPower can handle two of the company's fundamental-frequency model CCMT tuners or two harmonic tuners, such as the model PHT operating with second- and third-harmonic signals, with the capability of including an active module (AM). The software can also handle a combination of the fundamental and harmonic tuners for fundamental and second-harmonic testing, such as one at the source and one at the load side of a device under test (DUT). Working with the proper tuners, the software can optimize the source and load impedances at fundamental frequencies, second harmonics, and third harmonics for maximum gain, power, intermodulation distortion (IMD), power-added efficiency (PAE), output power at 1-dB compression, as well as adjacent-channel power ratio (ACPR).

The flexible program provides 30 different macro test routines, organized into three complexity levels, along with several predefined lists of measurement parameters. The macro operation makes possible complex load-pull and peak-search operations that are directed from script files. The "Design Window" function identifies impedance points satisfying combined target-performance requirements. The software/hardware combination supports a wide range of fixture- and tuner-calibration routines, including through-line-reflect (TRL) calibrations. A basic setup routine enables simple configuration of the measurement system.

Load-pull measurements can be performed at all calibrated points or within a user-defined measurement pattern. A computer mouse or scroll bars can be used for fine tuning source and load impedances at all frequencies. To speed measurements, the software can be used to detect oscillations and mark those bad points to avoid them during subsequent testing. The software can reduce source power during tuner movement or withdraw the RF probe to maintain low VSWR between impedance points.

The software's automatic installation subprogram makes it easy to load and start. The WinPower software is based on straightforward menus with comprehensive HELP files for all major functions. WinPower's HELP utility includes a selection of topics of general importance in load-pull and noise measurements, a section about frequently asked questions, as well as a collection of typically encountered hardware and software problems. This utility is updated on a regular basis and sent to customers through e-mail. The Windows version is compatible with files stored under the company's earlier DOS versions.

The software provides optimum operation when it is run on a PC with a Pentium microprocessor that offers at least 100-MHz clock speed and a minimum of 5-MB available hard-disk space. WinPower is available as a new software license or as an upgrade to the company's DOS software. **Focus Microwaves, Inc., 970 Montee de Liesse, Suite 308, Ville St. Laurent, Quebec, H4T-1W7, Canada; (514) 335-6227, FAX: (514) 335-6287, e-mail: info@focus-microwaves.com, Internet: http://www.focus-microwaves.com.**