1603 St. Regis
D.D.O., Quebec H9GB 3H7, Canada
Tel 514-684-4554 Fax 514-684-8581
E-mail: info@ focus-microwaves.com
Website: http://www.focus-microwaves.com

Application Note 47

Pulse Measurements Using the CCMT Load Pull System

Introduction

RF and DC pulse measurements are important for a number of reasons; they allow testing transistors in relatively cold junction condition. This is very important for determining and validating accurate physical-electrical equivalent models of most transistors. Also they represent a realistic operation for devices used in pulsed signal applications, like RADAR and other. Whereas most passive components of the test setup (including the programmable tuners) are wideband enough to let the pulsed signal pass without any distortion, the actual configuration and instrument triggering requires some understanding and attention to detail.

This note describes a pulsed signal and DC measurement setup using FOCUS' tuners and the required external GPIB instruments.

Description of the Setup

The Load Pull setup used for pulse measurements is shown in figure 1.

.

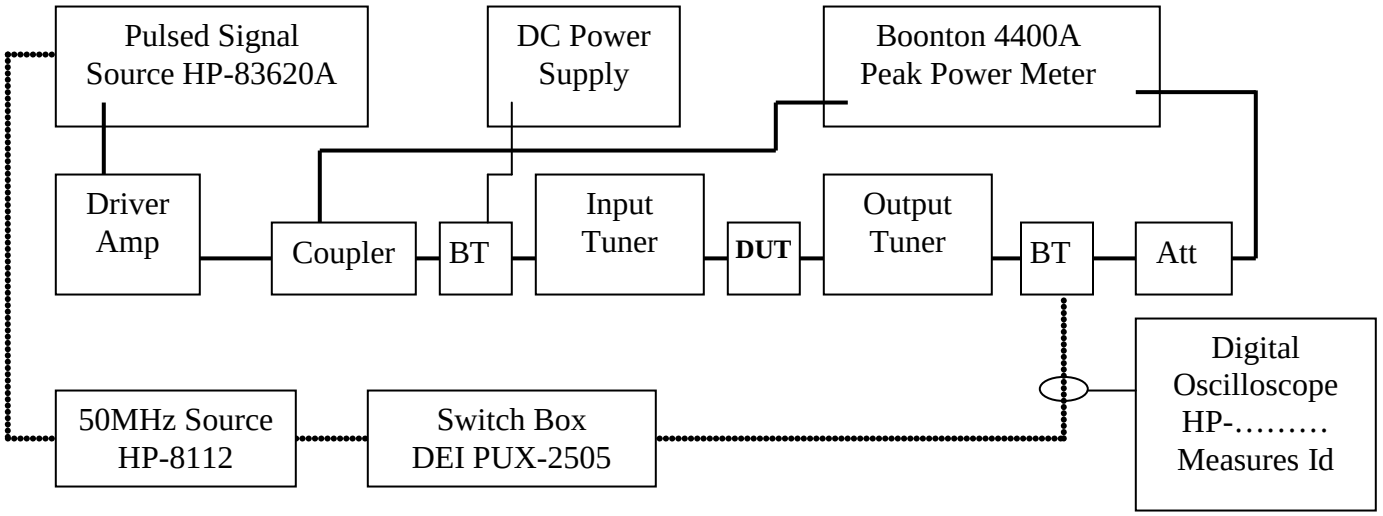

Figure 1: Load Pull setup for DC and RF pulse measurements

The pulse load pull setup consists of a pulse signal source (HP-83620A), a driver amplifier, two CCMT tuners, bias tees, couplers attenuators and a test fixture. The signal source is synchronized and triggers a 50MHz source, which generates a pulse modulated drain bias via a bias switch box (DEI PUX-2505). The pulsed drain current is measured by sampling with a digital oscilloscope (……). The RF pulses are detected at the input and the output of the DUT using a peak power meter (Boonton 4400A). All instruments and the tuners are controlled by an IBM PC desk computer.

The measurement software allows to calibrate all components of the setup, including the tuners and the test fixture (using a Focus proprietary TRL algorithm). This allows to make de-embedded measurements to the DUT reference plane of a number of RF and DC parameters; such as: DC voltages and currents, Gain, input and output Power, Intermod, Power added Efficiency and Droop. A very important parameter for pulse measurements is obviously the Droop. Droop is defined as the variation (drop) of output Power between the beginning and the end of a signal pulse (figure 2).

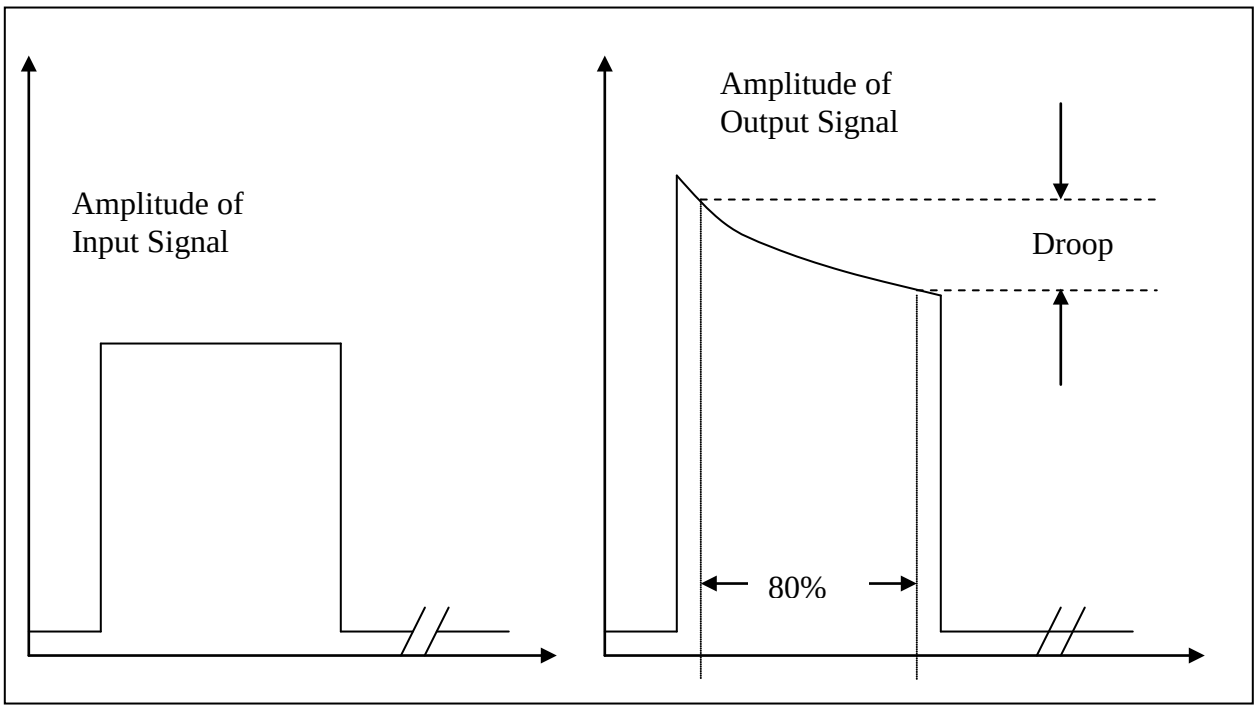

Figure 2: Definition of “Droop”.