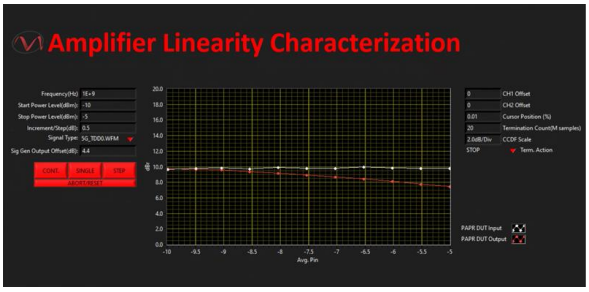
Power Amplifier Linearity Characterization

RTP5000 CCDF curves shown on the PMX40



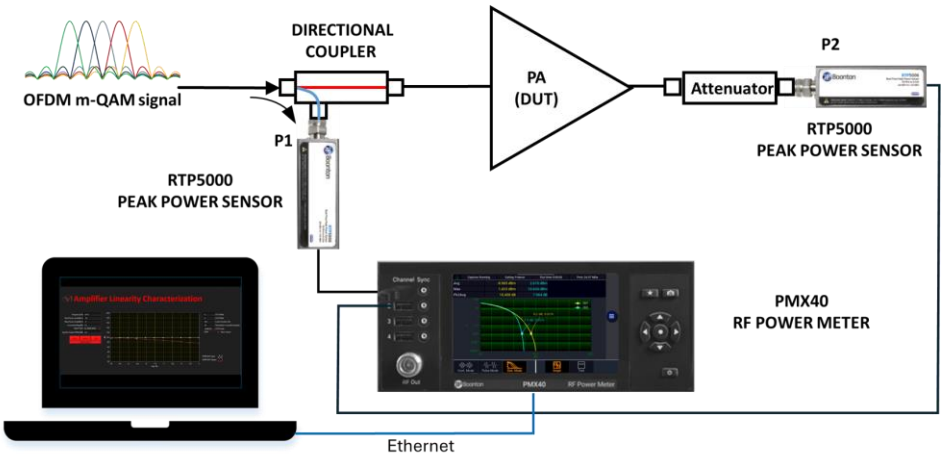
Example software: PAPR level for 0.01% probability varying with amplifier drive level

Modern m-QAM, OFDM systems exhibit high peak-to-average power ratios (PAPR). If the peaks are suppressed due to amplifier nonlinearity, symbol and bit errors may occur. The Maury Microwave RTP5000 Series USB Real-Time Peak Power Sensors can provide PAPR results and complementary cumulative distribution function (CCDF) curves, which show the probability of exceeding a range of PAPR levels.

In this demonstration, the Maury Microwave PMX40 RF Power Meter and RTP5000 sensors measure the CCDF at the input and output of an amplifier for increasing input power levels. By comparing the CCDF curves and extracting PAPR results obtained at each input level, a clear assessment of the amplifier's nonlinear behavior and its impact on signal integrity can be established.

The RTP5000 sensors have industry-leading performance with video bandwidth of up to 195 MHz, rise time as fast as 3 ns, time resolution as fine as 100 ps, and measurements speed of 100,000 per second. With models up to 40 GHz, the RTP5000 is a great solution for characterization of amplifiers used in Wi-Fi, 5G cellular, satcom, and radar applications

Demo Setup



Target Users

Target users include design engineers and technicians engaged in design, verification, and troubleshooting of RF/microwave amplifiers used in radar and communications applications.

Product Overview

RTP5000 Real-Time Peak Power Sensors to 40 GHz

The RTP5000 Real-Time Peak USB Power Sensors of the Boonton product line address challenges faced by engineers and technicians who design, verify, and maintain systems utilizing pulsed signals. The RTP5000 series incorporates Real-Time Power Processing™ and offers faster rise times; better time resolution; the fastest measurements; and a complementary, simple, intuitive, and powerful graphical user interface.

KEY SPECIFICATIONS AND FEATURES:

- Accurate pulse measurements
- Industry widest video bandwidth of 195 MHz
- Fastest rise time of 3 ns and finest resolution of 100 ps
- Crest factor, PAPR, CCDF, and statistical measurements
- Synchronized multi-channel measurements

Boonton Power Analyzer Software

The Boonton Power Analyzer (BPA) software is a Windows-based software package that provides control and readout of the RTP5000 and RTP4000 series power sensors. It is an easy-to-use program that provides both time-domain and CCDF views of RF waveforms with variable peak hold and persistence views. Power measurements are supported using automated pulse and statistical measurements, power level, and timing markers.

PMX40 RF Power Meter

The PMX40, compatible with RTP5000 and RTP4000 series power sensors, provides design engineers and technicians the utility of traditional benchtop instrument, the flexibility and performance of modern USB RF power sensors, and the simplicity of a multi-touch display built with award-winning technology featured in the Boonton product line.

KEY SPECIFICATIONS AND FEATURES:

- Frequency range from 4 kHz to 40 GHz
- Industry-leading 100,000 measurements per second
- Synchronous multi-channel measurements (up to 4 channels)
- Sensors can be used as standalone instruments
- Half-rack width makes best use of bench space

More Resources

Visit info.maurymw.com/ims-2024 to learn more about Maury Microwave solutions.