

What's New in Microwave Measurements?

Professor Nick Ridler *IEEE Fellow*

National Physical Laboratory, UK

Abstract

This lecture gives an overview of some exciting new developments that have taken place in the last 5 years or so in the area of high-frequency electromagnetic measurements.

The lecture concentrates on four main areas:

1. *Extending microwave measurement methods to higher frequencies.* The emphasis here is on waveguide and on-wafer measurements made in the frequency range from 100 GHz to 1,000 GHz (1 THz)
2. *High-speed digital waveform measurements on Printed Circuit Boards (PCBs).* This relates to measurements of fast rise-time signals on single and multi-layer PCBs. This includes differential signals using both micro-strip and strip-line architectures
3. *Large-signal nonlinear network analysis.* Many power amplifiers are required to operate in a nonlinear regime and so their characterisation (through measurement) needs to be done using large-signals and systems that capture the full nonlinear behaviour of the devices
4. *Measurement accuracy and traceability.* The need for accurate and reliable measurements is needed these days, more than ever. Reliability is usually demonstrated by making measurements that are traceable to the International System of units (SI)

This invited lecture was first given at an IET evening event in London during November 2015.