EMC Professional Talk

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Correlation Measurements Methods and Practical Applications for EMI Testing

Using the FFT-based measurement systems for EMI testing can reduce test time, improve the repeatability of EMI tests. With the availability of high speed high resolution ADCs and large computation power today FFT-based measurement systems exceed the performance of traditional EMI receivers, regarding noise floor, measurement speed and accuracy. Today a real-time analysis bandwidth up to 1000 MHz for Quasi-Peak in full compliance mode is available, reducing the test time from 9 hours down to 1 second. Such a Technology can be used to speed up full compliance testing. Using correlation analysis of such patterns allows identifying radiation direction of individual sources and the effect of EMI measures that have applied. EMC debugging on a complete system can be carried out based on the identification of sources. Another topic is the EMI measurement in presence of ambient noise. During the presentation a dual channel FFT-based EMI measurement system is presented. While the first antenna receives the signal of the EUT and the ambient noise, the second antenna only receives the ambient noise. By using a wideband LMS filter algorithm it is possible to cancel the ambient noise and show the EMI of the EUT. Measurement results show that typical ambient noise signals can be suppressed and even modulated signals of an EUT that are masked by ambient noise can be recovered. The system can cancel ambient noise with a bandwidth of more than 100 MHz. During the presentation the possibility for full compliance testing and the limitations of such a system are discussed.

Zoom:	https://ovgu.zoom.us/j/65212681357?pwd=T085Q3k5MUtUL01yaDhXNXkybkIzUT09
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About the speaker:
Stephan Braun studied Electrical Engineering at Munich University of Technology (TUM) and received his Dipl.-Ing. Degree in 2003. From 2003-2009 he was Research Assistant at the Institute for High frequency engineering, where he received in 2007 his Dr.-Ing. Degree. During this time the research was focused on the Theory and Application of Fully Compliant EMI Testing using Time-domain (FFT-based) Methods. He is working actively since 2007 for DKE and CISPR and has mainly contributed to the inclusion and definition of the FFT-based measuring instrument according to CISPR 16-1-1, CISPR 16-3 and CISPR 16-2-X. In 2010 this novel method became standard and is today referenced by almost all EMI Testing standards, including MIL461G. He is co-founder and managing director of GAUSS INSTRUMENTS International. He is Member of VDE, Electrosuisse and IEEE. He supports the IEEE Continued Education Program of the German Chapter and well as the IEEE EMC Bootcamp. He is author of more than 130 papers and is inventor of several patents, mainly about EMI testing, real-time signal processing and microwave circuits.

Organization:
Dr.-Ing. Miroslav Kotzev, Rohde & Schwarz GmbH & Co. KG