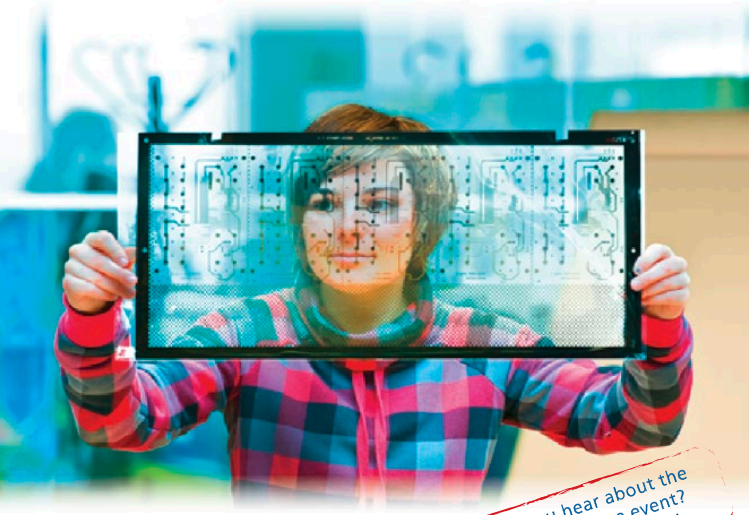
4th Power Analysis & Design Symposium

Advanced Characterization, Simulation,
and Troubleshooting of Electronic Power Systems



Did you hear about the additional pre event? Join our Open Lab!

Symposium: May 6th, 2015 / 08:30 - 17:00
Open Lab: May 5th, 2015 / 16:00 - 19:00
Eching (near Munich), Germany

With lectures, practical examples and demonstrations presented by international power supply experts from:

Biricha Digital Power, Linear Technology,
Microchip Technology, Picotest, Rohde & Schwarz,
Würth Elektronik and OMICRON Lab

Topics

Computer Generated Coefficients for Stable Digital Power Supply Design
by Dr. Ali Shirsavar - Biricha Digital Power

According to the latest market research, the digital power phenomenon is about to hit us like thunder. Most larger corporations in the power industry have already embraced this new technology, and are introducing products with performances unimaginable only a few years ago. New efficiency regulations are also increasingly forcing companies to swallow the digital power pill as such high performances are seldom possible with simple analog solutions. Many medium size companies are aware of that but they do not have the man power nor resources to train their engineers in this new technology.
This session is aimed at addressing the above issue. The most challenging part of a digital power design is the discrete time control loop coefficient calculations. In this technical session we will discuss this process in detail and highlight the calculations that you need to make in order to design a stable digital control loop. Having covered the foundation of digital power control loop design in detail, we will then introduce arguably the world's most sophisticated digital power supply design software which automatically calculates the control loop coefficients for the Infineon, Microchip and Texas Instruments range of microprocessors. The session concludes with real life loop measurement of the converter and direct comparison with the theory.

EMI Debugging with Digital Oscilloscopes - on the design engineer's desk
by Markus Herdin - Rohde & Schwarz

Debugging electromagnetic interference (EMI) is a challenging task. Identifying and mitigating the source(s) of unwanted emissions is often iterative and time consuming, multiple test rounds at an EMC laboratory costly.
The high sensitivity and powerful spectrum analysis capabilities of the Rohde & Schwarz digital oscilloscopes RTE and RTO allow to do a lot of the analysis already in the lab. Using near-field probes and coupling networks an R&D engineer can identify hot spots and do pre-qualification before going to the EMC test house. EMI reduction measures can easily be tested. This session gives an overview on the EMI debugging capabilities of the Rohde & Schwarz RTE and RTO oscilloscopes as well as an hands-on guide how to approach the problem.

Topics

Designing a filter is not as easy as it seems to be
by Markus Schubert - Würth Elektronik

The gap between calculation and the real world can be huge. This especially applies for the world of electronics. Deviations between theoretical filter design and the achieved performance of the filter can be caused by many reasons. For example unknown parasitics of the used discrete components or direct crosstalk in the printed circuit board layout can strongly influence the over-all filter characteristic.
So, there are a view things to know, to get the filter working as it should. This presentation outlines common pitfalls and helps to remember all these effects and to avoid mistakes in future designs.

A short introduction to loop gain measurements
by Florian Hämmerle - OMICRON Lab

The loop gain measurement is a standard method to verify the control loop stability of voltage regulators and switching power supplies. However, like for all measurements certain requirements and parameters need to be met to ensure correct and trustworthy results. The choice of the injection point for example is critical and defines the limits of the voltage loop gain measurement. Furthermore the signal level of the injected signal is crucial.
This lecture focuses on the loop gain measurement method and its application using the Vector Network Analyzer Bode 100. In addition to the voltage loop gain measurement two additional measurement methods are outlined that can provide results even when no suitable injection point for the voltage loop gain measurement is available.

The 3-port impedance measurement technique and its application in power supply testing
by Steve Sandler - Picotest,
presented by Bernhard Baumgartner - OMICRON Lab

Many engineers are familiar with the 1-port reflection impedance measurement and the 2-port shunt thru measurement. The former is ideal for measuring impedance in the range of 1 Ω to a few kΩ's while the latter is ideal for measuring from 1 mΩ to a few Ω's. The 3-port measurement can be used to measure from a few mΩ's to a few kΩ's and is also ideal for measuring the input impedance of switching power supplies and other system level circuits. This presentation provides an introduction as well as detailed instructions for the setup, calibration and examples using the 3-port impedance measurement.

Topics

Adaptive Software Slope Compensation in Digital Peak Current Mode Controlled Power Converters
by Andreas Reiter - Microchip Technology

Early DSP-based power converters were mostly used to "imitate" proven analog compensation filters in combination with programmability and design flexibility. These devices enabled designers to quickly respond to custom specific requirements with no or very little re-engineering and qualification efforts.
However, Digital Control is much more than just software-based analog circuit emulation. With increasing acceptance and experience in various applications, digital control has entered a new level of non-linear control. Over the years adaptive and predictive control methods have been developed to increase efficiency, performance and reliability simultaneously.
This lecture introduces one key example of how the flexibility of digital control loops can help to improve the total performance and bypass major common design trade-offs in peak current mode control using Adaptive Software Slope Compensation (ASSC). The basic concept, implementation and test results will be discussed and verified using OMICRON Lab's Bode 100.

LTspice - Your Virtual SMPS Laboratory
by Bostjan Bitenc - Linear Technology

In today's world, R&D engineers face shorter and shorter design cycles, high cost/innovation pressure and increased design complexity. Computer-aided design is essential to keep pace with constantly growing requirements. LTspice is the world's most popular power electronics simulator. It aims to simplify power supply design and verification tasks, leaving more time for creativity and innovation. This session gives a comprehensive overview about the various aspects of SMPS design (topology selection, impact of parasitics/layout, bode/impedance analysis, thermal simulation, etc.) that can be covered with LTspice.

Register until:
April 24th, 2015

Registration

Please register online at
www.omicron-lab.com/event

No time to attend?
Visit us at PCIM Europe in Hall 6 booth 103

Pre-Evening Event: Open Lab

Join our Open Lab after your daily work is done. We will have several measurement benches ready for you, where we can measure power supplies together. So come whenever you want, have a beer, bring your device and do some great measurements with us.

The Lab will be open on May 5th from 16:00 - 19:00.

Symposium Agenda:

08:30 - 09:00 Registration
09:00 - 10:00 Key note by Dr. Ali Shirsavar
10:00 - 10:30 Coffee break and exhibition
10:30 - 12:00 Lectures & demonstrations

12:00 - 13:00 Lunch

13:00 - 14:30 Lectures & demonstrations
14:30 - 15:00 Coffee Break and exhibition
15:00 - 16:30 Lectures & demonstrations
16:30 - 17:00 Discussion & closing

Seminar partners

ROHDE&SCHWARZ
PICOTEST
LINEAR TECHNOLOGY
BIRICHA DIGITAL
WÜRTH ELEKTRONIK
MICROCHIP

Participants

- Power electronics design engineers working on analog and digital power supplies who want to ensure stable system performance.

- Electronic engineers who need to assess the quality and stability of a power supply they are using or planning to buy.

Free Participation

The participation in our symposium is free of charge and will include lunch and refreshments during breaks.

Venue

The Symposium and the Open Lab event will take place at:

Bürgerhaus Eching
Roßbergerstraße 6
85386 Eching (near Munich)
Germany

Accommodation & Travel information

All details for recommended accommodations and travel information can be found on our web page:
www.omicron-lab.com/event

If you have any questions, please feel free to contact us whenever needed!

Your Contact

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