

EMC Week Summary and Schedule

Boulder City, NV

Monday of EMC Week: Derek Walton, LFRsearch owner

“EMC Testing, An Overview (Know What You are Getting Yourself Into!)”

This is a very informative day's presentation on EMC testing: commercial, military, medical, and more. Your chance of a first pass EMC test result is greater if you know what the EMC tests are all about. Different types of EMC testing are described with many examples to illustrate both EMC testing and what can happen in the field in the absence of testing. EMC testing can be a value added exercise, serving as a last “quality” check of a design before it hits the field, potentially avoiding costly field problems. During this first day of EMC Week you will find out how. This presentation is also a great introduction to the rest of the EMC Week presentations.

Tuesday of EMC Week: Kenneth Wyatt, EMC Consultant

“Troubleshooting & Pre- Compliance Testing at Your Facility (Know Before You Go!)”

In this presentation, we'll be discussing the most common EMC design issues causing product compliance failures. I'll be describing a simple, low-cost, EMC troubleshooting kit you can assemble. I'll discuss several options for affordable spectrum analyzers and probing solutions. We'll then discuss troubleshooting techniques and pre-compliance tests, using your kit, you can perform right at your own facility for both radiated and conducted emissions. We'll also cover some simple immunity tests for radiated and conducted immunity, ESD, and electrically fast transient (EFT). We'll wrap up with several case studies and demos showing how to perform some of these tests. With this knowledge, you'll be able to assess the EMC performance of a product prior to submitting it to a compliance test facility. By performing your own pre-compliance test, you can save thousands of dollars in repeated 3rd-party testing and weeks of time. “Know before you go!”

Wednesday of EMC Week: Dan Beeker of NXP Semiconductor

"PC Board Design for Compliance," Understanding how Electromagnetic Fields behave and design techniques to properly manage their use.

Electromagnetic Fields for Normal Folks: Show me the pictures and hold the equations, please!

The material presented will be focused on the physics of electromagnetic energy basic principles, presented in easy to understand language with plenty of diagrams. Attendees will discover how understanding the behavior of EM fields can help to design PCBs that will be more robust and have better EMC performance. This is not rocket science, but an easy to understand application of PCB geometry.

Effective PCB Design: Techniques to Improve Performance

As IC geometries continue to shrink and switching speeds increase, designing electromagnetic systems and printed circuit boards to meet the required signal integrity and EMC specifications has become even more challenging. A new design methodology is required. Specifically, the utilization of an electromagnetic physics-based design methodology to control the field energy in your design will be discussed. This training module will walk through the development process and provide you with guidelines for building successful, cost effective printed circuit boards

Power Distribution Made Easy

This presentation will present a simple EM physics and geometry-based approach to designing power distribution networks on PCBs. From input power connection to the IC die, the simple rules discussed can be used to reduce power supply noise and improve EMC.

PCB Design Techniques to Improve ESD Robustness

This presentation will give some simple definitions for ESD/EOS, and describe the important differences in the energy involved and the type of damage that can result. PCB design techniques for improving system robustness will be presented.

Thursday of EMC Week: Douglas C. Smith, Design Consultant and University of Oxford Course Tutor "Pulsed Immunity (ESD/EFT) Design and Troubleshooting"

ESD and EFT problems can be difficult to solve because the ESD test illuminates the entire system. Techniques will be presented that narrow down ESD/EFT immunity problems to a single path, wire, or device in the system in minutes instead of days. Each technique will be demonstrated on circuits. In addition, a new nasty form of ESD that plagues systems and is not known in the ESD community will be explained and techniques for eliminating it presented. A new test method will be presented that will likely find the worst case failure mode of your system to head off safety or other field problems in the field. It is much more severe than ESD testing but every engineer needs to know the failure mode of a system and this method will likely find it in a few minutes or less. As a bonus, a technique will be presented that will find the source of radiated immunity problems in systems in minutes as well. Also covered are test errors made during immunity testing that can erroneously fail a good system and ruin your day! The techniques covered were developed by myself and are not in textbooks or well known in the EMC field.

Friday Morning of EMC Week: Douglas C. Smith, Design Consultant and University of Oxford Course Tutor

"Advanced Troubleshooting Techniques – Finding Hidden Problems in Designs Early"

Doug will cover techniques he has developed over the years to find hidden design problems that can cause a field disaster or last minute compliance problems. These techniques are fast and powerful, often yielding results in minutes when conventional troubleshooting methods have not worked, even after weeks or months of effort. Most of the methods are not known in the engineering world except through Doug's courses. Recently added is a section on TLP (transmission line pulse) testing of system ports at low cost to find design issues that can "leak" through system testing and result in field problems.

Bonus section: Test lab errors that can fail a good system or vice-versa. This section will show you what to be on the watch for when you take your system to a lab for testing.

Friday Afternoon of EMC Week: Expert Panel Session

"Ask The Experts"

We will be hosting an expert panel session on Friday afternoon to answer all of your product specific or other questions. If you can bring a sample of your product, we can make some measurements on it and offer an evaluation. Want to try applying a 50,000 Volt stress to your product to see its failure mode? We will have the equipment there to do it as well as more mundane EMC pre-compliance measurements.