

March

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DLS News & Views

To help keep you better informed

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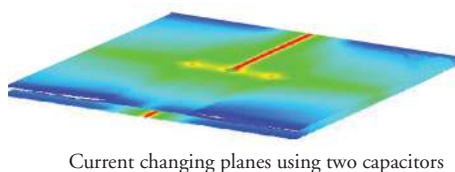
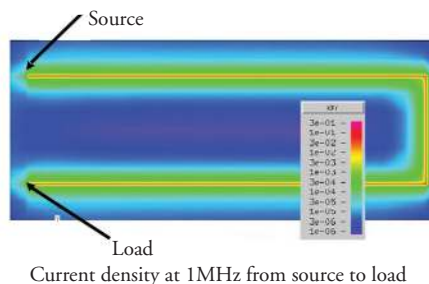
Were you looking for something else?
Call 847-537-6400

Design Seminar contents expanded

EMC & Signal Integrity

Our EMC Design Seminar has always been about giving you the best information available. So when Don recently heard Bruce Archambeault's presentation to the IEEE Board of Directors in November, he immediately read Bruce's book and made arrangements with him to share some of his material with you.

It is so important that you understand the why's of designing when meeting the emissions and immunity standards. With the addition of Dr. Archambeault's latest material, along with the material from Michel Mardiguian's book, and the nearly 80 years of experience Roger and Don bring to the class, you will leave with an understanding of what causes EMI, how the components that are used to suppress emissions work and don't work, and the ability to improve immunity. You will see visually how currents really travel on the PCB and you will be given tools to allow you to estimate your emissions.



In addition to PCB design, we will be adding more material on filter design using data from PSPICE simulations. This is another example of how the D.L.S. workshop has evolved over 25 years and why it has been attended by close to 2500 engineers and design personnel.

When you leave this class you will take with you:

1. D.L.S.'s printed handout with a copy of the 500 plus slides presented, with an area for your notes.
2. A copy of the book *Controlling Radiated Emissions by Design*, 2nd edition, by Michel Mardiguian, edited by Donald L. Sweeney, a \$165 value.
3. A copy of *PCB Design for Real-World EMI Control*,

Special discount

Due to hard economic times, we are offering a never before additional discount. The price for the four-day seminar workshop if registered before March 25 will be \$1090 (a 21% discount) for the first person from a company; the 2nd and all additional people from the same company will pay only \$790 (a 43% discount). This discount ends March 25 and will probably never be repeated. To register call Carol at 847-537-6400. For a detailed class description go to www.dlsemc.com/1001.

- by Bruce Archambeault, a \$139 dollar value.
4. Software developed by Roger Swanberg of D.L.S., not commercially available.
5. A copy of PSPICE.
6. A free product review where we apply the principles you have just learned to "your" product.
7. The knowledge and understanding of the EMI/EMC principles and techniques to design low-emission, high-immunity circuits. Priceless.

What is a Free Product Review?

You will join a D.L.S. staff member to discuss your own product. You will learn what you are doing right and be given suggested changes which will improve the EMC characteristic of your product. To quote one student who sat down with Don, "I would not have even understood what you were talking about had I not just attended your class!" By attending the class you will understand why we are making the recommendations during the review. You will also understand how to implement the changes using the proper technique.

D.L.S. iNARTE Test Center

D.L.S. is proud to announce that it has met the requirements of the International Association for Radio, Telecommunications and Electromagnetics, Inc. and is declared to be an authorized testing center for iNARTE. An authorized test center is a facility which meets the iNARTE guidelines to offer exams to FCC commercial license applicants, as well as to professional engineers who want to become iNARTE certified. Please contact us at 847-537-6400 for the next scheduled date that the tests will be offered or visit www.dlsemc.com



regulatory requirements **UPDATE**

IEC 61000-4-3 Radiated Immunity > 1000 MHz Required

Throughout the years, we at D.L.S., have been tracking changes to EMC standards used in obtaining CE Marking for Europe. These EN standards are used to demonstrate compliance to the 2004/108/EC EMC Directive. It is a given that once a standard is harmonized (published), it will periodically undergo updates via amendments, be revised with newer editions or replaced all together with a new standard. The important issue here is that manufacturers and laboratories need to stay abreast of these changes. Laboratories have to stay current and knowledgeable while manufacturers need to keep pace verifying continued CE compliance of their products.

The latest trend in many EN immunity

standards is to extend the radiated requirements above 1,000 MHz. For many years, Generic/Product EN standards called for IEC 61000-4-3 radiated immunity in the frequency range of 80 to 1,000 MHz.

Table 1 below provides examples of current immunity standards now calling for testing higher than 1,000 MHz. It is important to note that **if a device has been placed on the European market with radiated immunity testing to 1,000 MHz and the standard used to demonstrate compliance has changed, e.g. > 1,000 MHz radiated immunity, the device will need to be re-tested before the implementation date, i.e. DoW.**

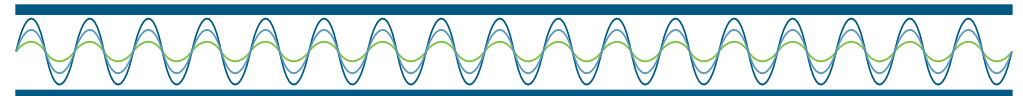
Example of Product & Generic Standards with Radiated Immunity testing > 1,000 MHz			
CE Marking (European) EMC Standards Radiated Immunity Requirements	IEC 61000-4-3 Testing and measurement techniques Radiated, radio-frequency, electromagnetic field immunity test 80% am modulation @ 1kHz		
	80 – 1,000 MHz	1,400 – 2,000 MHz	2,000 – 2,700 MHz
Industrial Generic immunity EN 61000-6-2:2005 DoW = June 2008 (in effect today)	10 V/m *	3 V/m	1 V/m
Domestic Generic immunity EN 61000-6-1:2007 DoW = December 2009	3 V/m	3 V/m	1 V/m
Measurement, Control & Laboratory EN 61326-1:2006 DoW = February 2009	3 V/m ~ Minimum 10 V/m ~ Industrial	3 V/m ~ Minimum 3 V/m ~ Industrial	1 V/m ~ Minimum 1 V/m ~ Industrial
Detection & Measurement of Combustible Gases, Toxic Gases or Oxygen EN 50270:2006 DoW = June 2009	3 V/m ~ Type 1 10 V/m * ~ Type 2	3 V/m ~ Type 1 3 V/m ~ Type 2	1 V/m ~ Type 1 1 V/m ~ Type 2

DoW - Date of Withdrawal (implementation date)

* Except for the ITU broadcast frequency bands 87-108 MHz, 174-230 MHz, 470-790 MHz, where the level shall be 3V/m

D.L.S. Expands HIRF Capabilities

In order to keep pace with our customers' ever increasing needs, D.L.S. has expanded its capabilities to perform High Intensity Radiated Field Testing for MIL-STD and RTCA requirements. In addition to our ability to perform 200 V/m (AM or CW) from 10kHz - 40GHz, and 600 V/m (PM) from 400MHz - 40GHz, we can now reach levels in excess of 2000 V/m (PM) from 1 - 18 GHz.



Proposed Changes to RoHS Directive

Proposed revisions to the Restriction of Hazardous Substances (RoHS) European directive were published in December 2008. Since the original document became effective, the number of fully compliant products has fallen far short of expectations. To address this, changes were developed to resolve uncertainties, improve implementation, reduce costs, simplify enforcement, clarify the scope and minimize different interpretations.

Here are the most significant revisions:

- No additional banned substances now
- List created of 4 priority substances of concern to be assessed for possible future ban (HBCDD, DEHP, BBP & DBP)

- Substance restrictions will now only be imposed based on scientific evidence of unacceptable health risks, instead of as a precautionary principle (as done before)
- Medical devices removed from exempt list and added as Category 8 (in scope Jan 2014 at earliest)
- Monitoring & control equipment removed from exempt list and added as Category 9 (in scope Jan 2014 at earliest)
- Added better definition of compliance responsibility (now includes each part of supply chain - manufacturers, importers, distributors & authorized representatives)
- RoHS will become a CE Marking directive

(Continued on next page)

CISPR 22 Update -

CISPR 22 has gone through many changes since the first edition released in 1985. Of particular interest is the inclusion of Telecom equipment into the third edition (1997) of the standard and the associated test requirements for common-mode disturbance on Telecommunication ports. Impedance Stabilization Networks (ISN's) were introduced with the intent of providing a voltage measuring port suitable for connection to a measuring receiver while satisfying the telecommunication port common mode termination impedance requirements. Many EMC labs (D.L.S. included) bought the ISN's and associated equipment necessary to run the tests of this new requirement. Unfortunately, due to variations in the interpretation of ISN design and calibration requirements, significant discrepancies were found in measurements when using Impedance Stabilization Networks (ISN's) that were manufactured by different companies. This finding created quite a stir in the industry, nowhere more so than in the EU community. The EU incorporated CISPR 22 edition 3 into EN55022:1998, and published it as a Harmonized Standard. Because of these new findings, the Date of Withdrawal of the then-current version of EN55022 was delayed by several years, until August 1, 2006. Until then, manufacturers had the option of using EN55022:1994 with A1 & A2, or EN55022:1998 with A1 & A2. The CISPR committee went back to work re-writing the standard to try to eliminate the miss-interpretations and update the standard for new technologies.

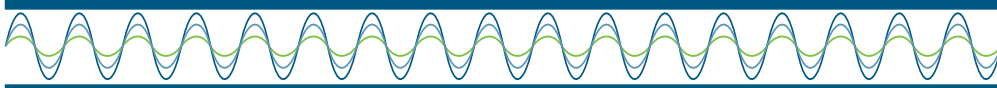
DLS has made a significant investment and acquired the ISN's necessary to perform testing to the latest version of the standard.

CISPR 22 Ed. 5.2 (2005) adopted many changes to the Telecom Port conducted emissions section. Mainly, the characteristics of the design of all ISN's changed significantly, and a requirement for an 8-wire (4 balanced pair) ISN was added. D.L.S. Electronics has made a significant investment and acquired the ISN's necessary to perform testing to the latest version of the standard. We can perform Telecom port conducted disturbance testing on anything from

2-wire Cat 3 up to and including 8-wire (4 balanced pair) 1000Base-T CAT 6 Ethernet. The current version of the standard, CISPR 22 Ed. 5.2, was published in March 2006 and was incorporated into a harmonized EU standard (EN55022:2006). The EU

standard has a DoW of 1.10.2009, which means that after October 1, 2009, EN50022:2006 becomes mandatory and the use of EN55022:1998 with A1 & A2 is no longer allowed.

Other notable changes to the CISPR 22 standard include a new clause 11 that requires the calculation and reporting of measurement uncertainty in test reports. Amendment 1 to CISPR 22: 2005 introduced limits for radiated emission measurements for emissions measurements above 1GHz.



RoHS (cont'd)

requiring product marks, technical documentation and a formal declaration of conformity

At this time, this is only a proposal and the European Union (EU) still needs to formally agree to all revisions. However, since these changes are based on 2 industry consultations and several expert studies, it is highly likely that it will be completely adopted, though changes and amendments are still possible. Per the EU, the end result of the new RoHS will be environmental improvements and reduced health risks in

products, along with reduced waste. Please contact D.L.S. for any questions.

Aerospace Testing Interview with Jack Black

The December issue of Aerospace Testing International Magazine features an interview with Jack Black, D.L.S. Business Development Manager. Find out about the latest in composite testing, COTS requirements and avionics lightning updates. To see the interview in its entirety, go to www.dlsemc.com/1012

More than a test...

D.L.S. provides a wide variety of services that stretch far beyond the testing aspect of the normal product certification process. Over the past 25 years, D.L.S. has found that the compliance testing industry relies on the ability of many people to work together in order to get a job done, and done right, the first time. The communication between the people in sales, receiving/shipping and testing departments is the key that will make your experience with us the most productive. Our attention to detail avoids the higher costs and missed timelines that could otherwise exist. Working with the D.L.S. team (one that is experienced, accredited, and knowledgeable, and is willing to put you first) is the best way to get your product to market quickly and cost effectively. The timeline of testing is taken very seriously at D.L.S., and issues concerning time, money, and the people involved are always dealt with the utmost of care.

In addition to the norm, at D.L.S. we specialize in unique equipment applications. Our lab has the capability to test a wide variety of products no matter how large. We work with a wide number of shipping and transport companies that allow us to handle virtually any shipping needs our clients might have. Even if the project consists of several machines, or pieces of equipment, and the scope of the assembled equipment is too big for us to test at our facility, we can complete the test by taking our equipment to your place of business.

During the testing phase of your project our engineers, along with the administrative support staff, will make sure your experience here is most pleasant. Accommodating our clients needs is the most important aspect of what we do. Whether we are coordinating third party witnesses from government agencies for military and avionics projects or coordinating the clearance through customs on equipment sent for testing from overseas, our goal as a company is to provide a fast and accurate service for our clients and the products they are trying to market. Let us know your needs and how we can help.

By Daniel Pecak

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Seminar Price Reduction

Due to
hard economic
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For a PDF copy of this newsletter, go to www.dlsemc.com/newsletter

Learn to control signal return currents on PCB's

and learn how EMC and signal integrity are interrelated

using *textbook by Dr. Bruce Archambeault of IBM*

"PCB Design for Real-World EMI Control"

and videos showing simulation of current flowing on PCB's



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April 23, 24, 27 & 28, 2009
Hilton Hotel, Northbrook, IL



Due to hard economic times, we are offering a special discount

\$1090 (a 21% discount for the first person) and \$790 (a 43% discount for additional persons from the same company)
if you register for the April 2009 seminar/workshop by March 25, 2009

Classes fill quickly so register early

email cgorowski@dlsemc.com or call 847-537-6400

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