Dated Material - Meeting Notice.
IEEE SCV EMC Society
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IEEE/EMC/SCV CHAPTER
Meeting Tuesday October 14, 2003
LOCATION: Applied Materials Bowers Café
3090 Bowers, Santa Clara, CA 95051-0804
5:30 p.m. Social
7:00 p.m. Discussions

Spectral Lines

www.scvemc.org Santa Clara Valley Chapter of IEEE Electromagnetic Compatibility Society

October 2003 Issue

SCV IEEE/EMC Society Meeting

Tuesday October 14, 2003

Time: 5:30 p.m. Dinner and Social

Place: Applied Materials Bowers Cafe, 3090 Bowers Avenue, Santa Clara, CA 95051-0804

Subject: The Dual Challenge of Electromagnetic Compliance and Environmental Compliance

Speaker: Dr. Rocky R. Arnold

Abstract:
OEMs and their design teams face a myriad of increasingly difficult challenges when it comes to rapidly and effectively accomplishing new product development (NPD). Choices made by the team at the onset of conceptual and prototype design strongly influence the ability of the final product to be compliant with respect to EMC. Compounding the problem of EMC is the increasing importance of environmental compliance. With the advent of regulations that prevent the use of lead in electronic devices, soldered components, including metal cans, will face higher prices as methods to remove metal cans for recycling purposes must be developed. The presentation will focus on alternative methods of achieving both EMC and environmental compliance.

Biography:
Dr. Rocky R. Arnold is Founder, President and CEO of WaveZero, Inc. (Sunnyvale, CA) launched in 2000. Since 1994, he has been involved in technology start-up funding and enterprise management. Working for a Sunnyvale electronic products design firm he led the RF design team, held the position of Director, Business Development and was instrumental in developing the firm's strategic position that lead to their `acquisition by a` public company in 1998. Prior to 1994, he created an R&D department for a small business and secured, as a Principal Investigator, over 20 Phase I/II/III Small Business Innovation Research (SBIR) awards. He was been the Principal Investigator on three U.S. Army SBIR projects involving EMI/EMP protective structures and gaskets made from conductive polymer materials. He has authored over 50 technical and scientific reports and numerous papers involving composite materials, structures and EMI shielding.

Dr. Arnold received his M.S. and Ph.D. in Civil Engineering (emphasis Structural Mechanics) from Stanford University in 1980 and 1983 respectively. He received his M.S. in Mechanical Engineering (emphasis wave propagation and acoustics) from the Massachusetts Institute of Technology in 1972. He graduated from the University of Missouri (Rolla) in Mechanical Engineering in 1970. He also has an MBA from Notre Dame de Namur (1993).

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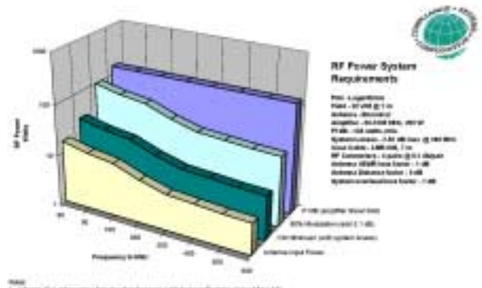
Selecting EMC Amplifiers

Understanding your test requirements for RF power amplifiers will help you select the right amplifier for your needs. The chart shows a typical plot for a "biconical-log" antenna, the power required to overcome the system losses, the additional 5.1 dB of power to accommodate the 80% modulation required by IEC 61000-4-3 and the 1dB(compressed) (or "linear") power rating of the amplifier. If all the curves are in front of the last wall, the system will deliver the required field strength with modulation and headroom. (it will work!)



For the calculation, use a forward power curve for the antenna and add 1dB for antenna VSWR and chamber coupling effects. A plot of the typical power thus required at the antenna is shown on the ***first wall*** *(yellow) portion of the chart.*

Add the cabling losses. Count connector pairs, typically four, and add a loss of 0.1 dB per mated pair. Adding the sum of the coax, connector and any switching losses will give you the loss profile (curve) Add 1 dB to this curve to cover overhead and degradation over time. Then, calculate the RF power required at the antenna to develop the test field level shown as the ***second wall*** *(green). (20V/m @ 1m distance from 80-1000MHz CW)*

The ***third wall****, (blue) shows the 5.1dB of additional power to support the 80% AM modulation that is required. Using an undersized amplifier above its linear power rating clips the modulation peaks and severely stresses the amplifier.*

The **fourth wall** (purple) shows a straight line for the minimum "linear" power specified by the manufacturer of the amplifier. RF power amplifiers are probably the least understood and poorly treated asset in the laboratory. Under-powered systems cause the amplifiers to be driven hard into varying and mostly high VSWR loads. Although tube amplifiers are famous for withstanding this environment, they as well as their solid state counter parts slowly degrade with time. A simple routine maintenance program will assure that your system is performing as designed, thereby maintaining the integrity of your testing results.

Mr. Lowell Beezley; Compliance Systems Corporation (714) 572-1338 info@compliancesys.com

Map:

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3090 Bowers, Santa Clara, CA 95051-0804