Darnells Power Forum

Darnell's Power Forum (DPF '10) has expanded its focus to include the latest developments on GaN power devices, the Smart Grid, Energy Harvesting and Digital Power.

Will enhancement mode GaN transistors (eGaN) replace power MOSFET/IGBTs in power management applications? Alex Lidow, CEO of Efficient Power Conversion, believes it will. He will explain why at Darnell's Power Forum '10 Plenary Session, on September 13th, in Chicago. His paper, "Driving eGaN Transistors for Maximum Performance," will discuss the differences between eGaN and power MOSFETs and will show how to drive these devices to fully exploit their benefits in applications such as DC-DC conversion, Class D audio, and motion control. GaN compounds are being touted as the "best candidates" to replace silicon power devices. Adapting MOSFET driver ICs is one way to efficiently switch GaN. Lidow will also propose a specification for an "ideal" eGaN driver that would allow the designer to easily extract their full performance.

What are the power implications of the Smart Grid? Everyone in the power supply community wants to know this, but not much has been agreed upon. Darnell's Power Forum '10 will bring some clarity to this question with a session on, "Enabling the Smart Grid." One of the presentations in this session will be given by Bob White from Embedded Power Labs. His paper, "A New Method of Monitoring and Reporting Average Input Power," will address the problem of getting energy use information from the power supply to the energy management process. This is one of the fundamental challenges of any "smart grid" implementation, requiring accuracy, averaging intervals, minimal data age, and minimal latency. The key is to transfer the computation burden to the host system, which is the resource with the most computational power. Other speakers in this session will include Mark Szalkus from GE Digital Energy and Chuck Thomas from Electric Power Research Institute.

Like most emerging technologies, energy harvesting is evolving to meet certain needs in specific applications. Even though some of this has already been established, challenges still remain that enterprising companies can take advantage of. Fraunhofer Institute has been doing applied research in energy harvesting for many years, and they will be presenting their latest findings during the Plenary Session at DPF '10. Energy harvesting techniques must adapt to different environments, sources of energy and applications. Fraunhofer's paper, "Maximizing Energy Output of Energy Harvesting Power Supplies with Adaptive Power Management," will address how adaptive power management can cope with different thermal gradients, amplitudes, and frequencies to harvest "what is possible." There is no "one-size-fits-all" power management solution when it comes to energy harvesting, but this presentation will provide up-to-date data that can be used in product design and planning.

Digital power management and control is now mainstream, used in many power

supplies and systems without fanfare. Are there still opportunities where digital is not being exploited to its full benefit? Yes, and Darnell's Power Forum is where these opportunities will be discussed. It's no longer about what digital can do, but changing application demands. For example, ChiL Semiconductor will discuss the latest industry trend of CPUs and GPUs requiring short bursts of high current, and how this affects VR design. "Designing for Transient Loads That Exceed Thermal Design Limits" will look at the requirements/restrictions placed on the controller and the power stage. They will also discuss digital design for transients, and the increased need for tight, highspeed phase balance to keep the inductor currents equal – comparing and contrasting the different analog and digital approaches to high-speed phase balance.

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