TI Technology United Kingdom
Session Titles & Abstracts

Session 1
10:00 – 11:00

Track 1

Digital Power: Solving point-of-load power requirements with innovative and configurable Fusion Digital Power Controllers & digital support devices

While most of the power solutions used nowadays for non-isolated Point-of-Load power are based on analog control, more and more high performance applications benefit from the use of full digital control or digital assisted control. The digital approach provides a new degree of flexibility, enables digital system communication and monitoring. The topic covers TI solutions for this approach and will present not only the dedicated controllers but also available support devices like digital MOSFET drivers, system monitors / managers and power interface devices for current limiting and hot swap management with digital control interface.

Track 2

Bringing Light to Life (Lighting & LED Drivers + WebBench Tools)

This presentation will discuss fundamentals of driving LEDs and how specific drivers perform those topologies and various functions. Then highlight several new products in National's lighting portfolio designed to address indoor and outdoor general illumination. Moving on to discuss how to use WEBENCH LED Designer for LED and LED driver selection, circuit design and BOM computation, electrical and thermal simulation; and introduces the new WEBENCH LED Architect tool. A preview of National's upcoming lighting technology to offer the maximum ease of use to end customers will close out the session

Track 3

Digital Isolation Techniques and Implementation

Multiple options are now available to electronics designers to implement galvanic isolation. Apart from choosing between capacitive, optical and inductive/magnetic isolation technologies, they must also contend with the various isolation standards regarding voltage ratings and creepage/clearance distances. This discussion intends to simplify the decision-making associated with choosing the right isolation solution

Track 4

Hands-On Session: Intorduction to CCS4 and how to optimise the power consumption of MSP430F5x based systems (Part1)

In this module, MSP430 overview will be followed by hands on training using Code Composer Studio CCS4 IDE and MSP430 launch pad tool. You will learn how to create new or to import existing projects and how to debug them. The most important project properties are discussed and the basic views of the C/C++ and debug perspective will be presented. In a step by step approach you'll experience and learn how to optimize power consumption of MSP430 based systems

Track 5

Linux Application Debugging with Code Composer Studio™ Software

Learn how to develop and debug Linux applications using the Code Composer Studio™ IDE v5. Many customers of Sitara™, Integra™ and DaVinci™ devices spend much of their time developing Linux applications. In this session, you will learn how Code Composer Studio software can be used for both kernel-level debugging as well as application debugging

Session 2
11:00 – 12:00

Track 1

Pushing efficiency in isolated AC/DC and DC/DC solutions

The topic provides insight into green power and high efficiency initiatives and shows ways how to achieve the targets of those regulations. It will cover PFC- as well as the isolated downstream converter stage. Concepts like synchronous rectification on secondary side and its use for replacing the bridge rectifier in a PFC stage will be discussed. Solutions based on quasi-resonant, resonant, phase shifted, interleaved and active clamped power topologies will be presented.

Track 2

High speed serial data transfer is an analog problem.

This presentation will discuss the subject of moving large amounts of data over high speed LVDS and CML interfaces. We will look at the different family of parts to do this with data rates up to 9.45Gbps. In particular we will focus on the latest high speed embedded clock serial interface family, Channel Link III, with its asynchronous embedded bidirectional control channel. We will then also look at techniques for extending the reach of LVDS and CML interfaces by using a range of signal conditioning parts, including parts for extending the reach of HDMI, DVI and CAT-5 cables To close we will show how to do a simple link budget analysis, see some example applications and review the available support material on the Website.

Track 3

Hardware System Design for Low Power RF Products

There are several aspects to consider when designing an RF system. This session discusses key areas that are vital to consider when selecting, designing and testing a Low Power RF device. Topics include: Regulations, How to Select the correct device for your application, Hardware Design issues, PCB Layout, Antenna Selection and Hardware Testing.

Track 4

Hands-On Session: Introduction to CCS4 and how to optimise the power consumption of MSP430F5x based systems (Part 2)

Continued from Session 1

Track 5

Practical Uses of C5000 in Audio, Biometrics, Medical and Sensors

TI's latest low-power digital signal processors provide energy efficiency and longer battery life for portable and energy efficient applications such as voice recorders, vital-signs monitors, fingerprint biometric analyzers, ... During this session, we will review the reference kits and development boards that are available for the C5000. Attendees will be able to see the Fingerprint development kit, the medical frontend carts, the MP3 audio playback, the dynamic monitoring of Power Consumption and the development boards.

Session 3
13:00 – 14:00

Track 1

Power your DSPs, FPGAs and medium to high performance processors (INTEL CPUs included) – Voltage regulators and their applications

Interested to get insight into the new D-CAP™ control modes and their performance advantages compared to Voltage Mode or Current Mode control? The topic will cover this and will provide additional information about features helpful in medium to high-end embedded systems like overshoot reduction (OSRTM), regulator stability w/ MLCCs, ECO-Mode™, VID output voltage selection, output discharge, true differential output voltage sensing, … . Solutions based on LDOs, DC/DC converters and controllers will be shown together with ways how to push efficiency under all load conditions with the latest generation of Power MOSFETs and power blocks.

Track 2

PCB Thermal Management for Power Devices & Switching Power Supply EMI Mitigation

This session introduces the basic concepts of thermal performance and management. Provides real world examples and design guidelines for optimizing PCB thermal performance. Test methods and calculation techniques are discussed, as are package types, and thermal specifications. This session does not cover simulation methods. The overall goal of this session is to provide the designer with practical solutions and insight into how to improve thermal performance. + Switching power supplies are one of the primary sources of EMI (Elecromagnetic Interference). This presentation explains the sources of both conducted and radiated EMI and presents practical methods to control it. There will be some discussion of various standards and test and measurement methods. The focus is on PCB layout, component placement, and passive filtering, with other methods described in brief.

Track 3

So You Want Wi-Fi? On-Board vs Module WLAN using TI's WL1271 (Given by LSResearch)

This session discusses Wi-Fi from a developer's point of view. Topics covered include: WLAN standards overview, hardware design considerations including antenna design and EMC testing, and TI's WiLink™ 6.0 chipset based solution implemented using TI's OMAP3530 and WL1271. We will also explore the module that LSR has developed for TiWi™ solutions to help your design get to production faster. This session given by LS Research.

Track 4

Motor Control and Drives

Whether you are trying to control a small battery-driven brushed DC or a hundreds-of-kilowatts AC servo motor, TI offers a portfolio of microcontrollers and complementary integrated motor drivers, industrial interfaces, and high performance analog-to-digital converters that fit your needs.In this track we will walk through TI's hardware and software solutions for each motor type ranging from integrated analog motor drivers of the DRV8x family (for driving brushed DC, stepper and 3-phase motors) over Stellaris® 32-bit ARM Cortex-M3 and Piccolo™ 32-bit microcontrollers featuring advanced control algorithms driving multiple motors including PFC. We will also review the appropriate power-stage, analog signal chain and interface products.

Track 5

Swift Boot How to dramatically reduce boot time (Given by MPC Data a BSQUARE Company)

Many embedded developers are now turning to Linux for use in embedded systems. One problem with using a fully functional high level OS in your product is that the boot time for a system to reach a useful state can be quite long; sometimes in the order of 10s of seconds. This may be unacceptable, particularly when users of consumer products are used to electronic devices becoming functional much quicker than this. This lecture looks at a number of techniques that can dramatically reduce boot time. MPC Data will use the OMAP3530EVM evaluation board as a reference system to show how, with careful analysis and modification of the bootloader, kernel and user-land apps, boot times to a working Linux system can be reduced to the order of one second.

Session 4
14:00 – 15:00

Track 1

Tips and Tricks for your power designs

This presentation is a collection of different circuits and tips providing insight how to extend the basic feature set of power devices and how to use them in a way not obvious on the very first view.

Track 2

Direct RF sampling using National's GHz-ADC

Radio frequency (RF) sampling in uplink wireless standard with ADC's delivering sufficient resolution, multi-GHz sampling rates and bandwidth at a feasible cost is now a reality. The 12 bit ADC12D1800RF is capable of sampling signals beyond the first Nyquist zone at sampling rates up to 3.6 GS/s. A channel signal to noise ratio (SNR) of 80.7 dBFS can be obtained in 5 MHz which is adequate for the third and fourth generation wireless standard. Key specifications of the ADC are the Noise Spectral Density (NSD) of -147.7 dBFS/Hz in a blocking condition and the input 3rd order intercept point (IIP3) of 27.5 dBm. An example front end design with the ADC is presented. More than 12 dB of margin is obtained on the IIP3 and more than 6 dB of margin is obtained in the NSD. These operating margins make GHz capable ADC a compelling solution for wireless applications.

Track 3

Tackling EMI and RFI at the Board and System Level

Electromagnetic Interference (EMI) and Radio Frequency Interference (RFI) can affect any system in an undesirable manner as the proliferation of unintentional radiators and receptors continuing to increase. EMI and RFI, an undesirable byproduct of electrical systems, produce a wide range of frequency spectra that can affect otherwise properly operating circuits. During this seminar hour, we will review the fundamental principles of radiated interference and coupled interference, along with the respective allowed limits for both of these interference sources. In this discussion, we will describe transmitters and receivers along with techniques to mitigate the effects of both culprits. The solutions we will cover will be effective power line filtering, proper filtering for input signals of high gain circuits, and details on key components. Finally, we will discuss the common rules of thumb for wire and PCB routing to minimize EMI and RFI effects. With this seminar you will see some basic methods that will help reduce sources and receptors of EMI and RFI events in and near your circuits.

Track 4

Stellaris ARM Cortex™ - M4 with Floating Point Unit MCU

This session will provide you an insight into the Cortex-M4F architecture, key peripherals (such as USB OTG, motion control, high speed 12 bit ADC, etc.), hardware tools and the StellarisWare software offering. Stellaris MCUs and ARM Cortex-M4F offer a direct path to the strongest ecosystem of development tools, software and knowledge in the industry. Designers who migrate to Stellaris will benefit from great tools, small code footprint and outstanding performance. The Stellaris family offers the industry's first and broadest implementation of Cortex-M4F and the Thumb-2 instruction set

Track 5

Multi-Protocol Industrial Communication – a flexible, scalable and open solution

Industrial communication is many times implemented in separate devices which are not standard products. The industry has not found a single standard for industrial communication like Ethernet and USB in consumer world. In addition many companies have build their proprietary protocol for internal buses like backplane buses on remote IOs. The communication function spans over multiple layers of the industrial automation pyramid asking for a scalable solution for sensors, drives and PLCs. Programmable Realtime Unit is presented as a flexible, scalable and open IP to address the market needs for industrial communication. Examples of various protocols are discussed are discussed in more details

Session 5
15:30 – 16:30

Track 1

Battery management: Gas Gauging, Charge Management and Wireless Power

Growing expectations from the end user regarding state of charge of the batteries incorporated in portable equipment drives sophistication in charge management as well as accuracy of run time prediction. This track provides detailed insights into different gas gauging methodologies and achievable results as well as limitations utilizing latest technology improvements. It will give guidelines on how to choose the optimal charger topology for a given application. Wireless Power Consortium (WPC) has defined a Wireless Power transfer standard up to 5W. A complete solution (TX/RX) to this standard will be presented here.

Track 2

More Power to the Power Designer

WEBENCH Power Designer allows users to rapidly design and optimize power supplies. This presentation will introduce the user to the basics of WEBENCH Power Designer including regulator selection, circuit design and BOM computation, electrical and thermal simulation. In addition the use of Power Architect for designing power supply systems will be described. The presentation will also cover the newest additions to the SIMPLE SWITCHER® power module family, featuring load currents up to 10A, frequency sync, current sharing, and pin-to-pin compatibility to deliver an entire portfolio of ease-of-use solutions. Including the brand new SIMPLE SWITCHER® nano modules

Track 3

Trade-Offs for various Filter Topologies

Why filters: anti-aliasing, noise-reduction, reconstrction after DAC, etc. analog vs. digital filters, filter types, FIR, IIR, SINC, ...; latency and settling time (WPC) has defined a Wireless Power transfer standard up to 5W. A complete solution (TX/RX) to this standard will be presented here.

Track 4

C2000– Concerto Industry's First dual Core C28 + M3 solution for motor control, smart grid, solar and many other applications

When communication meets controlling, Concerto is the first dual microcontroller cores chip (C2000+ Cortex M3). It is TI's first Multi-Core Micro-Controller that separates the controlling from the host process by taking the overheads that are involved in interrupts and communication away from the real time processor. In this track we will start by understanding the market that this processor is aiming, we will show the full solution including a deep dive into the dual core of F28M35x. We will go through the different peripherals each core has for a better understanding ofthe communication between the cores. For the SW side we will show the tool that controls both the cores and the debugging process for both cores within it. We will also go over the boot sequence of the dual core and understand how easy it is to program the chip.

Track 5

DaVinci processors, unprecedented performance and integration for video applications

The DaVinci family of processors provides a range of video encode and/or decode solutions from single channel Standard Definition (D1) up to multichannel full High Definition (1080p60). There is also a range of application specific reference designs for IP Cameras, Digital Video Recorders, and Remote Media Displays that provide customers a quick time to market as well as a full TI eBoM. There will be a particular focus on the latest DM816x and DM814x products that provide multi and single channel full HD capability alongside the power efficiency and processing performance of the ARM Cortex A8.