



Technology Day Huntsville – June 2, 2011

Time	Session	Power	Military, Space, & Interface and Protection	Embedded Processing	Wireless Connectivity
8:30 to 9 a.m.	Registration				
9 to 10 a.m.	1	Battery Management Basics and Wireless Charging	Hi-Rel Solutions for Harsh and Extreme Environments Where Extended Operating Temperature, Quality and Reliability are First and Foremost	What's Next for TI Embedded Processing Microcontrollers	RF Basics, Tools and Getting Started
10 to 10:15 a.m.	Break				
10:15 to 11:15 a.m.	2	Digital PWM Controllers for Analog Point-of-Load Designers	Hi-Rel Solutions for Space Applications	How to Select the ARM for Your Design	Texas Instruments Wireless Products and What Works Best for Your Design
11:15 a.m. to 12:30	Lunch				
12:30 to 1:30 p.m.	3	Powering Modern Applications Processors and FPGAs	ESD Protection: Protecting the Complete System	Linux Development on ARM-Based Microprocessors	Fundamentals of Antenna Design and Modules <i>by LSR</i>
1:30 to 1:45 p.m.	Break				
1:45 to 2:45 p.m.	4	Achieving Better Transient Response with Less Output Capacitance from Your DC/DC Power Designs	Interface Standards Comparison for Industrial Networks	Enhancing the Value of TI's Video SoCs Using Application-Specific Video Codec Offerings	Adding Wi-Fi and <i>Bluetooth</i> ® to TI Embedded Processors (MCUs and MPUs)
2:45 to 3 p.m.	Break				
3 to 4 p.m.	5	TINA-TI™ Software 9: A New Simulation Solution for 2011	Digital Isolation Techniques and Implementations	FRAM for Ultra-Low Power	Lower Power RF Design Tools to Help You Characterize Your Radio Products

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Track and Course	Abstracts
Track 1 – Power	
Battery Management Basics and Wireless Charging	This session will be a basics overview of charging, protection, chemistries, gas gauging and some of the newer battery management products that support those application needs. This session will also introduce the Wireless Power Consortium standard and present the solutions that TI has for wireless power.
Digital PWM Controllers for Analog Point-of-Load Designers	This is an introductory session covering the UCD92xx digital power controller product line and Fusion Digital Power Designer software (Fusion GUI), including the features and benefits of the digital controllers and related UCD72/74xx drivers and PowerTrain modules for nonisolated multirail power systems. Sequencing, voltage tracking, fault limits/response, communication and other topics will be covered. This will be followed by a configuration/monitoring/control example demonstrating digital power's functionality and flexibility using the UCD9224EVM-464 hardware.
Powering Modern Applications Processors and FPGAs	The presentation will center about the power supply of FPGAs and modern application processors like TI's AM35xx, AM L1xx, DM3xx, as well as processors from competitors like Freescale iMX, Samsung 3SC64xx, SiRF Atlas IV and NVIDIA's Tegra series. We will present the power and sequencing requirements and how they can be implemented using TI catalog power management ICs. Circuit examples, reference designs and new power management ICs that make designing a power supply for FPGAs and processors easier will be shown.
Achieving Better Transient Response with Less Output Capacitance from Your DC/DC Power Designs	The TPS54225, TPS54226, TPS54235 and TPS54326 are new product offerings in the switchers with integrated FETs (SWIFT™) product line. They represent a significant addition to the product line, with a totally different control mode from other SWIFT devices. They are very low cost and require a minimum number of external components to target cost-sensitive consumer and other applications. These devices use a proprietary D-CAP2™ Mode control topology, which exhibits some very high performance characteristics not normally found in low-cost devices and also eliminates bothersome external compensation. Transient response is extremely fast and the TPS54226 and TPS54326 feature a power-saving auto-skip mode. This presentation fully explains the D-CAP2 Mode control scheme, shows its advantages and high-performance features, and provides an analysis with both TI and competitor products.
TINA-TI™ Software 9: A New Simulation Solution for 2011	TINA-TI™ software has been TI's free circuit simulator for five years. During that time, TI has released hundreds of macro-models and reference designs that can be simulated. This capability allows you to quickly evaluate parts, validate designs to ensure first-pass success, and, if necessary, debug problems. This session will provide an introduction to TINA-TI software, with an emphasis on new features in version 9. We will cover topics such as modifying EVM schematics to meet your needs, importing third-party models, running simulations, performing visualization/analysis of simulation output, and using parametric sweeping to improve your design.



Track and Course	Abstracts
Track 2 – Military, Space, Interface and Protection	
Hi-Rel Solutions for Harsh and Extreme Environments Where Extended Operating Temperature, Quality and Reliability are First and Foremost	TI has comprehensive signal-chain portfolio solutions for high-temperature (HT) and enhanced products (EPs) where extended operating temperature, quality and reliability are critical. Our HT parts are qualified to withstand operating temperatures of -55°C to 210°C for harsh environment and industrial electronics applications. The value propositions, applications, roadmaps, extended temperature qualification requirements and characterization techniques will be covered for the final product solutions, which include known good die, ceramic nonorganic material and plastic package offerings (for 175°C). Our EPs are qualified for customers to a variety of extended temperature qualification offerings. We will cover details about what EP is, the value proposition, the extended temperature qualification process and product roadmaps.
Hi-Rel Solutions for Space Applications	TI has a comprehensive signal-chain portfolio offering of parts that have been optimized for high reliability (hi-rel) environments such as space, high-altitude aircraft, and some medical devices where components must survive various radiation conditions. This course will cover the various radiation effects that must be mitigated in IC design and manufacturing for applications into satellite, high-altitude aircraft, missile and medical devices such as CT scanners. We will cover basic terms and effects, as well as some techniques used at TI to “radiation-harden” these products to survive various radiation conditions for these environments. Additionally, we will cover Space product value propositions, current product offerings and product roadmaps.
ESD Protection: Protecting the Complete System	System-level ESD protection at the interface connector is particularly challenging. Semiconductor chips based off advanced-low-voltage, small-geometry process nodes enable miniaturization, more power savings and better economy of scale. But it poses an even bigger challenge to provide ESD immunity, since it becomes more difficult to design robust ESD solutions as the process geometry gets smaller. External ESD clamp circuits or integrated protection devices are popular choices to enhance system-level ESD protection. This presentation will cover key system-level ESD challenges, common techniques to improve overall system-level ESD performances, TI’s IPD solutions and selecting the right ESD clamps for a given application.
Interface Standards Comparison for Industrial Networks	A wide variety of solutions exist for communicating between equipment in industrial applications. This session discusses the various standards and compares the trade-offs between their different protocols and physical/electrical interfaces. The standards include PROFIBUS, CAN, DeviceNet, ControlNet, ModBus, IO-Link and several flavors of industrial Ethernet.
Digital Isolation Techniques and Implementations	Multiple options are now available to electronics designers to implement galvanic isolation. Apart from choosing isolation technologies like capacitive, optical and inductive/magnetic, they must also contend with 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 and Course	Abstracts
Track 3 – Embedded Processing	
What's Next for TI Embedded Processing Microcontrollers	From ultra-low-power MSP430™ MCUs and high-performance TMS320C2000™ real-time controllers to 32-bit general-purpose ARM-based MCUs and Stellaris® ARM Cortex-M3 MCUs, TI offers the broadest range of embedded control products. Join this session to learn more about TI's MCU portfolio.
How to Select the ARM for Your Design	You know you need a CPU in your system, and you're pretty sure you want to go with some form of an ARM core. But what form does that CPU take? Should it be a mainstream microprocessor, a DSP, an ASIC, an FPGA, a configurable core or something else? What are the advantages and disadvantages of each of the ARM options? What if you've already selected your OS? How does that affect the choice of CPU? How do you ensure that you're getting the maximum performance from your CPU? These are just some of the questions/issues that we'll tackle in this session. Choosing the best ARM processor for your design can be a difficult decision. In this session, developers will gain insight into the trade-offs between varying ARM-based processors, including TI's Stellaris® Cortex-M3-based microcontrollers and Sitara™ Cortex-A8- and ARM9-based microprocessors. The session will address key design considerations, including power, interface, software support and performance requirements. We will also offer processor selection tips and tricks through industrial automation and human interface application examples.
Linux Development on ARM-Based Microprocessors	Linux development on ARM-based microprocessors can be a daunting task. The purpose of this session is to introduce the Texas Instruments Sitara™ Linux software development kit (SDK). The SDK provides customers with a unique out-of-the-box experience and a quick path to their application development. The Sitara Linux SDK accomplishes this by providing example applications for key high-touch IP and peripherals. This session will also discuss Matrix, a Qt/E webkit-based HMI and application launcher, the SDK installer and Code Composer Studio™ software v5, an Eclipse-based IDE for Linux application development and debugging.
Enhancing the Value of TI's Video SoCs Using Application-Specific Video Codec Offerings	There are multiple application areas in the video compression field: digital cinema, cable and satellite digital video transmissions; video telephony and telepresence; video surveillance and security; machine vision and recognition; medical imaging, mobile handsets, mobile Internet devices (MIDs); and other handheld devices (multimedia players, digital cameras/camcorders). Each one has their specific key requirements. This session will focus on the software features of video codecs, which are market-specific; highlighting them can make the case for TI's solutions stronger. With a focus on video codec offerings for the DM36x, DM816x and DM814x, we will discuss SVC-T, smart codec features such as ROI, error-resiliency features, VC market-specific features such as low-latency video codecs, H241 packetization and RCDO profiles, analytic information-sharing for video surveillance markets, multichannel capabilities, and application-specific knobs for different rate control algorithms. At the end of this session, you will be equipped with information on compression capabilities for different video codecs and critical application-specific software differentiations to win custom
FRAM for Ultra-Low Power	Ferroelectric random access memory (FRAM) is the next-generation non-volatile memory technology for ultra-low-power embedded microcontrollers. Its fast write capability (like DRAM), practically unlimited write endurance (>1,014 cycles) and ultra-low power consumption benefits developers and end users alike. This presentation will describe the new MSP430FR57xx FRAM family and the capabilities behind this newly integrated memory technology to enable ultra-low power applications. FRAM's ability to function as universal memory helps ease the life of developers, reducing development time (faster time to market) and costs. In addition, FRAM enables several new, exciting ultra-low-power applications such as batteryless intelligent sensors.



Track and Course **Abstracts**

Track 4 – Wireless Connectivity

RF Basics, Tools and Getting Started Have you been told by your manager to go remove the wires from the design? Not sure where to start? This presentation serves as an overview of the parameters and considerations a designer would use to select a low-power wireless (LPW) solution. It also highlights devices and tools from TI and how they fit in a typical low-power RF design.

Texas Instruments Wireless Products and What Works Best for Your Design Ever wonder what wireless standard best fits into your embedded system? Texas Instruments supports a variety of wireless products, from standards such as *Bluetooth*® and ZigBee to proprietary radio hardware. How the standards fit in a typical design can be confusing. This session covers the TI wireless portfolio and compares the operation of these radios and standards with the trade-offs of each. The discussion will touch on all of these standards: 6LoWPan, *Bluetooth*®, *Bluetooth*® low energy, ZigBee, ANT, WiLAN, RF4CE, the SimpliciTI™ network protocol, RFID and proprietary solutions. We will also talk about what modules are available for evaluation and design support.

Fundamentals of Antenna Design and Modules by LSR Antenna design is one of the most intimidating and important parts of any RF design. It is critical to understand the key factors involved when choosing an antenna topology, as well as what tools are needed for design, simulation and characterization. Designs must account for the effects of the enclosure material, the available space, the required radiation patterns, EMC compliance rules and regulations. This presentation discusses the fundamentals of antenna design for short-range devices, as well as the trade-offs between size, cost and performance. An antenna that is properly designed and optimized will enhance the overall performance of any radio. LSR will also discuss the advantages of using a precertified off-the-shelf module for quick time to market and minimal engineering investment.

Adding Wi-Fi and *Bluetooth*® to TI Embedded Processors (MCUs and MPUs) Quickly and easily add Wi-Fi and/or *Bluetooth*® technology to systems using TI MPUs (AM/DM37x, AM18x) and MCUs (MSP430™, Stellaris®). In this session, we will start with an overview of the WL1271-TiWi 802.11b/g/n + *Bluetooth*® transceiver and CC2560-PAN1325 *Bluetooth*® transceiver, and then go into the details of the platform. The platform provides complete system integration of all components including WLAN and *Bluetooth*® hardware, host hardware, Linux WLAN drivers, supplicant, TCP/IP integration, *Bluetooth*® stack, profiles, example code for configuration, and sample source applications. We will demonstrate how to establish a Wi-Fi and *Bluetooth*® connection by showing a sample application running on an AM/DM37x EVM.

Lower Power RF Design Tools to Help You Characterize Your Radio Products SmartRF™ software is a low-power RF tool designed to help you understand the operation, programming and analyzing of Texas Instruments Low Power RF radio products. This session will discuss all of the new changes that have been brought to the SmartRF software tool, aiming at making more information available and presenting it in a very intuitive and understandable way. After this session, you will understand how to install the tool and then perform these analyzing tasks: measuring signal strength and packet error rates, code/register export functions, XML configuration and strobe panel commands.

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