Technology Day Anaheim
October 4, 2011

Time	Session	Signal Chain Design	FETs, Wireless, & Audio	Power	Microcontrollers	ARM® / DSP	Workshops
8 to 9 a.m.	**Registration & Booths / Continental Breakfast**						
9 to 10:30 a.m.	1	Op-Amp Stone Soup: A "Cookbook" Collection of Single-Supply Op-Amp Circuits	How TI NexFET™ Power Block and Power Stage Technology Enable the Highest Efficiency and Power Density in Low- to Medium-Input Voltage Power Systems	Battery Management Basics	Introduction to the Stellaris® ARM® Cortex™-M4F Family	Choosing the Right ARM® Processor for Your Design	Hands-on Workshop: Touch Using MSP430™ – Design, Libraries and Programming with Capacitive Touch BoosterPack (Part 1)
10:30 to 11	**Break / Booths**						
11 a.m. to 12:30 p.m.	2	Inside the Delta-Sigma Converter: Practical Theory and Applications	New, Differentiated Audio-Enabled Products from TI for 2011 that Solve New Market Trends	The "Unpublished" Tips and Tricks of Power Supply Design	Concerto™ MCUs – Eliminate Compromises by Combining the ARM Cortex-M3 with C28x™ DSPs in a Single-Chip Solution	Video Communications – Consumer and Enterprise *by Ittiam*	Hands-on Workshop: Touch Using MSP430™ – Design, Libraries and Programming with Capacitive Touch BoosterPack (Part 2)
12:30 to 2 p.m.	**Lunch / Booths**						
2 to 3:30 p.m.	3	SuperSpeed USB and Thunderbolt: Overview and Comparison	RF Basics, Tools and Getting Started	Power-Supply Layout Considerations	Motor Drive & Control Solutions	Enabling and Accelerating Android on Sitara™, Integra™ and DaVinci™ Devices	TINA-TI™ Software v9: A New Simulation Solution for 2011
3:30 to 3:45	**Break / Booths**						
3:45 to 5:15 p.m.	4	Low-Power Temperature Sensing Solutions Using Delta-Sigma ADCs	Adding Wi-Fi and *Bluetooth*® to TI Embedded Processors (MCUs and MPUs)	Achieving Better Transient Response with Less Output Capacitance From Your DC/DC Power Designs	Under the Hood of FRAM and the New MSP430FR57xx MCU Family	Linux Embedded Processing Development Made Easy	Switching Power Supplies Made Easy with SwitcherPro™ Software and the New, Powerful TINA-TI™ Software v9

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Session Titles and Abstracts

Track & Course	Abstracts
Track 1 – Signal Chain Design	
Op-Amp Stone Soup: A "Cookbook" Collection of Single-Supply Op-Amp Circuits	This presentation offers a “stone soup” collection of useful op-amp circuits to solve linear application problems on a daily basis. Each op-amp circuit (prebuilt in the included TINA-TI™ SPICE schematic) is presented as a definition-by-example, with a brief overview of its functionality, applicable transfer function and/or waveforms and key equations for rescaling the function to your exact application. A sampling of the ingredients include the following circuits: voltage-to-current conversion; drive circuits (bridge-tied load, parallel op amps, high-current cascade reference buffer); translation circuits (single-ended to differential, differential to single-ended, differential in to differential out); conditioning circuits (full-wave rectifier, supply splitter, integrator amp in feedback, isolation amplifier, G = 1/G = -1 amp); and comparator circuits (AC coupled, comparator with hysteresis).
Inside the Delta-Sigma Converter: Practical Theory and Applications	This presentation will take you inside the true workings of a delta-sigma converter, from modulator to digital filter. We will discuss basic concepts such as sampling frequencies (modulator vs. data rate), different types of digital filters and their advantages and disadvantages, settling times and latency, resolution, accuracy, and what "noise-free bits" really mean. Armed with this knowledge, you can decide if a delta-sigma converter is right for your application. This session will help debunk some of the myths around this popular converter architecture.
SuperSpeed USB and Thunderbolt: Overview and Comparison	SuperSpeed USB has shown significant growth since the first certified products became available in early 2010. Yet many customers are still asking what it is, and what they can do with it. In addition to the Intel/Apple announcement of Thunderbolt, many in the market have become even more confused about what each technology is intended for and when it should be used. The first part of this session will present a brief overview of SuperSpeed USB, followed by a brief overview of Thunderbolt and a discussion of whether Thunderbolt and USB are competing or complementary. The second part will review TI's SuperSpeed USB products and plans.
Low-Power Temperature-Sensing Solutions Using Delta-Sigma ADCs	Industrial temperature sensor signal conditioning and measurement using delta-sigma analog-to-digital converters can be driven by numerous design requirements, including integration, power consumption and precision of measurement. But what are the trade-offs that one must consider when optimizing a design? This topic will focus on the design considerations and the trade-offs in ADC-based techniques for temperature measurement, using thermistors and thermocouples optimized for low power, accuracy and precision.
Track 2 – FETs, Wireless, & Audio	
How TI NexFET™ Power Block and Power Stage Technology Enable the Highest Efficiency and Power Density in Low- to Medium-Input Voltage Power Systems	Switching-power supply FET technology is ever advancing. TI’s NexFET™ Power Block and Power Stage technology enable ~92% efficiency at output currents of >100 A today, and meet the ever-increasing power density and efficiency demands in line and portable power systems. You will come away from this session with a complete understanding of the system approach TI NexFET technology facilitates in TI power management solutions, and will understand TI’s NexFET Power MOSFET technology's competitive advantages in the marketplace.
New, Differentiated Audio-Enabled Products from TI for 2011 that Solve New Market Trends	Trends in markets using audio change overnight. This presentation highlights recent audio products that have been released by TI to address these new market challenges, how (specifically) TI solved the challenges, and how we are making it easy for our customers to speed their time-to-advantage with these new products/features and resulting user-perceivable benefits.

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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 the devices and tools from TI and how they fit in a typical low-power RF design.
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 MSP430™ MCUs. 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 walk through the sample applications and explain how you can get started developing Wi-Fi and *Bluetooth*® applications.
Track 3 – Power	
Battery Management Basics	This technology overview will cover charging, protection, chemistries, gas gauging and TI's portfolio, discussing advantages and hot products (roadmap).
The "Unpublished" Tips and Tricks of Power Supply Design	TI's Power Supply Design group will once again take attendees through tips and tricks that they have learned while designing and debugging power-supply circuits for TI's customers. Some content in this session will include cool circuits such as offline buck, LED drivers, and how to power a digital isolator. Also discussed will be SEPIC-coupled inductors, flyback vs. forward trade-offs and NexFET™ technologies, among others. You will leave this class amazed at what you learn.
Power-Supply Layout Considerations	This topic will address methods for keeping circuit parasitic components from degrading the operation of your designs. Techniques to minimize the impact of parasitic inductance and capacitance of filter components and PWB traces will be discussed, together with a description of the impact that PWB trace resistance can have on power-supply regulation and current capacity. A general overview of thermal design is also included, as well as sample temperature-rise calculations in a natural and forced-air environment. Finally, we will review some practical examples of power stage and control IC layouts.
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™) power 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 or other applications. These devices use a proprietary DCAP2™ Mode control scheme that exhibits some very high performance characteristics not normally found in low-cost devices, while also eliminating 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 DCAP2 Mode control scheme, shows its advantages and high-performance features, and provides competitive analysis with both TI and competitor products.

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Track 4 – Microcontrollers	
Introduction to the Stellaris® ARM® Cortex™-M4F Family	In this session, we will take an in-depth look at the new Stellaris® ARM® Cortex™-M4F family.
Concerto™ MCUs – Eliminate Compromises by Combining the ARM Cortex-M3 with C28x™ DSPs in a Single-Chip Solution	Real-time control, connectivity and software simplicity come together in TI's Concerto™ MCU series. Building on the C2000™ DSP family's industry-leading C28x™ DSP core and control peripherals, Concerto MCUs add a host subsystem consisting of the ARM Cortex-M3 core and new communication peripherals such as USB OTG and Ethernet. Combined, the Concerto MCU's host and control subsystems make a cleanly partitioned, single-chip solution to eliminate compromises. Learn more about Concerto MCUs and how you can simplify hardware and software development in application areas including industrial control, renewable energy, digital power, electric vehicles and more.
Motor Drive & Control Solutions	Overview and demonstration of the latest motor drive & control solutions featuring TI motor drivers and MCUs. We will start off with a review of the H-Bridge and key specs and features to consider when selecting an integrated motor driver. Current regulation, microstepping, decay modes, braking, protection features, and control interfaces will be covered along with an overview of the DRV8x motor driver family. We will then cover TI's MCU + DRV8x solutions, including the DRV88x Stepper and Brushed drivers paired with 16-bit MSP430 MCU and DRV83x for three phase inverter (BLDC and PMSM) with flexible plug and play MCU support from MSP430 or 32-bit ARM Cortex-M3 Stellaris and C2000 Piccolo. All three support TI's InstaSPIN-BLDC, a sensorless three-phase trapezoidal commutation technique that will instantly spin YOUR motor. Bring your own <24V <3.5A BLDC motor for the demonstration.
Under the Hood of FRAM and the New MSP430FR57xx MCU Family	This session is intended to introduce MCU designers to the latest in nonvolatile memory technology: ferroelectric RAM (FRAM). You will gain experience with the MSP430™ MCU's first FRAM offering – the MSP430FR57xx family – and become familiar with key architecture blocks such as the new power management module, clock system and FRAM controller. Advantages unique to FRAM such as ultra-low active power, fast writes and unified code memory will be covered, and attendees will learn about tools available to aid in starting development with this new addition to the MSP430 portfolio.

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Track 5 – ARM®/DSP	
Choosing the Right ARM® Processor 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 I've already selected my OS? How does that affect the choice of CPU? How do I ensure that I'm getting the maximum performance from my CPU? These are just some of the questions/issues we'll tackle in this track. Choosing the best ARM processor for your design can be a difficult decision. In this session, developers will gain insight into trade-offs between varying ARM-based microprocessors, including Sitara™ Cortex™-A8- and ARM9-based microprocessors. The session will address key design considerations, including power, interface, software support and performance requirements. The presenter will illustrate processor selection tips and tricks through industrial automation and human interface application examples.
Video Communications – Consumer and Enterprise by Ittiam	Communication has always been a quintessential part of human interaction and hence at the pinnacle of invention. We have come far from the days of pigeon carriers to modern-day cell phone communications. However, this has always been either text-only or voice-only communication and often non-real-time. Today, with improvements in infrastructure, video communications promise to bring people closer than ever before through videophones or other video communications-enabled devices. Video conferencing, or video communication, is a real-time interactive event where the user feels truly and closely connected. The video in the video communication may range from pictures of the participants, video clips and documentations (such as photos, diagrams, charts, graphics, etc.) to live video; the audio may include real-time audio signals from participants, as well as other audio and sound signals. With rapid development of communication infrastructures, broadband, 3G/4G wireless technologies, and the availability of fast video processors, a simple peer to-peer video telephony is no longer a big deal. The challenge needs to be taken to the next level of being able to connect multiple people at the same time vi multiparty/bridging scenarios. In this presentation, we intend to present how video communication systems work, with a brief history and applications; audio and video compression for video communication (audio/speech and video codecs and their customization); quality of service (QOS) for video communication; protocols and standards (ITU H.3xx and SIP); design considerations and implementation on TI platforms; and what's next for the technology. We will also run a real-time demo of a videophone with a built-in HD AV bridge on a TI platform.
Enabling and Accelerating Android on Sitara™, Integra™ and DaVinci™ Devices	With the availability of Android for TI's Cortex™-A8 devices, developers are now able to utilize the unique power of the Andoid application framework to create new, compelling designs. Attend this session to learn about Android fundamentals, including overview and key benefits, architecture review, how Android can benefit different end-equipment and applications (including voice/video applications), and the TI/Android roadmap.
Linux Embedded Processing Development Made Easy	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). This 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/Embedded Web kit-based HMI and application launcher; the SDK installer; and Code Composer Studio™ software v5, an Eclipse-based IDE for Linux application development and debugging.

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Track 6 – Workshops	
Hands-on Workshop: Touch Using MSP430™ – Design, Libraries and Programming with Capacitive Touch BoosterPack (Part 1)	This session helps you expand the functionality of your MSP430™ Value Line LaunchPad kit with the Capacitive Touch Booster Pack. Learn how to use the capacitive touch software libraries to interface your value line devices with cap touch buttons, sliders and wheels.
Hands-on Workshop: Touch Using MSP430™ – Design, Libraries and Programming with Capacitive Touch BoosterPack (Part 2)	This session helps you expand the functionality of your MSP430™ Value Line LaunchPad kit with the Capacitive Touch Booster Pack. Learn how to use the capacitive touch software libraries to interface your value line devices with cap touch buttons, sliders and wheels.
TINA-TI™ Software v9: 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 macromodels 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, visualization/analysis of simulation output, and using parametric sweeping to improve your design. Bring a laptop if you like and follow along, or laptops will be provided.
Switching Power Supplies Made Easy with SwitcherPro™ Software and the New, Powerful TINA-TI™ Software v9	In this hands-on training session, you will learn to generate custom power solutions in minutes with SwitcherPro™ software from Texas Instruments. The SwitcherPro software tool allows you to select TI parts and real-world components; analyze designs for efficiency, stability, size and other design factors; modify designs to meet your needs with Design Options, What if Analysis and User Defined Parts; and review your designs in the design report, complete with a full bill of materials and notes for layout. Please bring a laptop if you wish to follow along on your own, or laptops will be provided.

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