

TI Analog Application & Solution Seminar

March 30, 2006 • Tel Aviv, Israel

OVERVIEW

The 2006 Analog Application and Solution Seminar is part of a series of technical seminars produced by Texas Instruments.

This will consist of six different tracks: power solutions, signal chain/data acquisition and power module, wireless infrastructure, low power and interface application/solution, audio, video standard, Pb-Free and low power wireless by Chipcon.

There will be four different modules available from each track and will include a blend of concepts, tutorial reviews of basic principles and hands-on application examples.

All materials in the seminar are written and presented by Texas Instruments' experts.

AUDIENCE

This Seminar has been created for analog engineers looking for specific high performance and standard linear applications and solutions. This technical seminar focuses on the techniques of practical design applications with examples. The variety of topics makes this seminar beneficial to engineers of every experience level.

COURSE OBJECTIVES

To provide a learning forum where practical high performance analog design solutions, tools, techniques, topologies and examples will be presented. In addition standard linear applications will also be presented. Some practical demonstrations will be available. You will be able to meet a number of Texas Instruments' specialists.

While all topics will be fully documented in the manual you will receive at the seminar, time constraints may influence both the sequence and the specific topics to be discussed during the presentation.



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LOCATION

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REGISTRATION

Registration can only be done via the web and you may book up to a maximum of 4 different modules.

This seminar is **FREE of charge**.

To register and for additional information visit:

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(English language)

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COURSE AGENDA

POWER SOLUTIONS (UNITRODE SEMINAR)

Module 1: Sequencing Power Supplies in Multiple Voltage Rail Environments

This paper discusses sequencing principles and possible failure modes with incorrect sequencing as well as some of the more common sequencing requirements of Digital Signal Processors (DSPs), field programmable gate arrays (FPGAs), application-specific integrated circuits (ASICs) and microprocessors, and proposes a variety of practical solutions implemented with power management devices.

Module 2: Constructing Your Power Supply and Layout Considerations

This paper discusses the crucial elements of layout, including parasitic issues (trace inductance and capacitance) as well as impacts of trace resistance on power supply performance. Thermal issues are also discussed along with practical examples of power stage and control layouts.

Module 3: Interleaving Contributes Unique Benefits to forward and fly back converters

A 200-W interleaved forward converter design example illustrates how an interleaved topology can reduce the size and cost of power filtering components and also enhance dynamic load response. In this comprehensive design review, the converter operates from a standard 48-V telecom input voltage and outputs 12 V at 200 W in a half-brick footprint.

Module 4: Compensating DC/DC Converters with ceramic output capacitors

This subject discusses the implementation of the IEEE802.3 Power Over Ethernet, specifically for powered devices but also covering the specifications for those not familiar with this relatively new specification. The Power Sourcing Equipment (PSE) requirements will be discussed briefly.

SIGNAL CHAIN/DATA ACQUISITION & POWER MODULE

Module 1: Input Drive Considerations for SAR converters including modelling

In depth look at the input drive characteristics and dynamics of a Successive Approximation converter input stage including modelling the behavior.

Module 2: Data acquisition for bridge sensors

This presentation gives an overview of data acquisition for bridge sensors. We begin with a discussion of the bridge sensor, and introduce some theory. We then look at actual hookups of bridge sensors to ADCs. The ADS1232REF is introduced and discussed as an example of a real design. Finally, we briefly discuss the ADS1232REF's firmware.

Module 3: Analog Circuits for Remote Sensors

Taking a look at sensors and analog circuits that can be applied in monitoring the operating conditions of a remotely located system.

Module 4: Designing with TI's new T2 Power Modules featuring TurboTrans and Smart Sync

On complex boards, designers are increasingly asked to provide more voltage rails for a wide variety of DSPs, ASICs and FPGAs. Frequently, as many as 6-10 voltages are required, creating power system design challenges for sequencing, EMI suppression and minimizing voltage deviation in the presence of current transients created by high speed digital circuits. This paper discusses advanced latest techniques of TurboTrans and Smart Sync to reduce EMI and high speed current transients.

WIRELESS INFRASTRUCTURE

Module 1: Transmitter Design -TX Architectures

- direct up-conversion versus super-heterodyne architecture
- high Speed D/A converter technologies and use for individual implementation
- I/Q modulators designed for direct up-conversion
- single sideband architecture

Module 2: Improving PA efficiency with Crest Factor Reduction

- crest factor reduction for high P2A signals
- digital pre-distortion

Module 3: Receiver designs & modern IF sampling

A short section detailing the new Interface products and technologies from TI.

Module 4: PLL and clocking solution for low phase noise needs

- how to achieve best SNR in high IF ADC applications
- PLL synthesizer for RF

LOW POWER AND INTERFACE APPLICATION/SOLUTION

Module 1: Battery Selection, Safety and Monitoring in Mobile Applications

This topic describes in detail all considerations that have to be reviewed to select a battery for your specific application. The requirements to the electronics that services the battery, namely charger and safety devices, are reviewed. It also summarizes best handling practices depending on particular chemistry for most common rechargeable battery types.

Module 2: DC-DC Power Conversion & System Design Considerations for Battery Operated Systems

We will review the typical Li-Ion battery discharge characteristics and then discuss five commonly used DC/DC converters in portable power devices. Light load efficiency improvement, output voltage regulation accuracy, battery impedance impact on the system efficiency and system stability are also analyzed in detail.

Module 3: RS485 for the Security Electronics Market Plus Isolated Interfaces

RS-485 is used extensively in products such as camera PTZ (pan tilt zoom), digital video recorders (DVRs), access control systems (badge readers and door controls) and biometric components. This session will discuss the special challenges of these installations.

Module 4: High Speed Interface Connectivity

This section covers different high speed interface technologies that are used for data transmission applications. Technologies such as LVDS, MLVDS, LVDM and Gigabit Serdes will be covered. In addition, guidelines will be provided for selecting one of these technologies for a given application.

AUDIO, VIDEO, STANDARD LINEAR AND PB-FREE

Module 1: Intro to Designing with Class-D in portable audio products together with latest TI Low-Power Audio CODECs

In today's portable world, power dissipation is a hot topic. Moving to Class-D audio power amplifier technology offers power savings and longer battery life. Using TI low-power audio converters together with Class-D can further enhance use time. This presentation highlights how to design a complete audio solution based on TI portable audio products and the typical design issues that need to be carefully considered.

Module 2: What's New In Commodity Linear/ 2nd sources from 1st Source

- Low Dropout Regulators (LDO)
- OpAmps and Comparators
- Shunts, Switchers and Supervisors

Module 3: Video Decoders for Surveillance and Portable Media Applications

Understand how TI analog to digital video decoders can be used in both security surveillance and portable multi-media players. The discussion will provide you with an understanding of the decoders, how to connect them to additional TI hardware, layout and schematic tips, as well as a complete demonstration of TI's newest video decoder.

Module 4: This presentation is an update on Pb-Free/RoHS compliance

Time	Power Solutions	Signal Chain/Data Acquisition & Power Module	Wireless Infrastructure	Low Power and Interface Application/Solution	Audio, Video, Standard Linear and Pb-Free
8:30 – 9:00			REGISTRATION		
9:00 – 9:25			INTRODUCTION		
9:30 – 10:30	Sequencing Power Supplies in Multiple Voltage Rail Environments	Input Drive Considerations for SAR converters including modelling	Transmitter Design -TX Architectures	Battery Selection, Safety and Monitoring in Mobile Applications	Intro to Designing with Class-D in portable audio products together with latest TI Low-Power Audio CODECs
10:30 – 11:00			BREAK & DEMOS		
11:00 – 12:10	Constructing Your Power Supply and Layout Considerations	Data acquisition for bridge sensors	Improving PA efficiency with Crest Factor Reduction	DC-DC Power Conversion & System Design Considerations for Battery Operated Systems	What's New In Commodity Linear/2nd sources from 1st Source
12:10 – 12:45	TI 's High Performance Analog Solutions roadmap Overview	TI 's High Performance Analog Solutions roadmap Overview	TI 's High Performance Analog Solutions roadmap Overview	TI 's High Performance Analog Solutions roadmap Overview	TI 's High Performance Analog Solutions roadmap Overview
12:45 – 1:50			LUNCH & DEMOS		
1:50 – 3:00	Interleaving Contributes Unique Benefits to forward and fly back converters	Analog Circuits for Remote Sensors	Receiver designs & modern IF sampling	RS485 for the security electronics market plus Isolated Interfaces	Video Decoders for Surveillance and Portable Media Applications
3:00 – 3:30			BREAK & DEMOS		
3:30 – 4:40	Compensating DC/DC Converters with ceramic output capacitors	Designing with TI's new T2 Power Modules featuring TurboTrans and Smart Sync	PLL and clocking solution for low phase noise needs	High Speed Interface Connectivity	Pb-Free/RoHS Update Session
4:40 – 5:00			CLOSE & PANEL SESSION		

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