INTRODUCTION TO DC/DC CONVERTERS – TOPOLOGIES, CONTROL, MODELING, AND FEEDBACK LOOP DESIGN   9:00am – 6:00pm

Instructor: Dr. Richard Redl, ELFI S.A., Switzerland

ABOUT THE INSTRUCTOR: SEE SEMINAR 9

CONTENTS

This seminar provides a structured introduction to dc/dc converters. It starts with a review of the most important topologies, then continues with the discussion of the various control techniques, and concludes with an overview of the modeling and feedback loop design issues. The following topics will be presented:

Introduction: Definitions, basic laws and constraints

Topologies and operating modes
Square-wave converters
- Basic topologies and operating modes
- Nonisolated, isolated, and soft-switching derivatives
- Converters for wide input-voltage range
- Multiphase converters
- Transformer-coupled zero-voltage-transition converters
- Switched-capacitor converters

Resonant converters
- Quasi-resonant and multiresonant derivatives of basic square-wave converters
- Load-resonant converters

Control techniques
- Single-loop (voltage-mode, hysteretic) control
- Multi-loop (current-mode, charge, feedforward) control
- Auxiliary control functions: loss reduction, overload protection, current sharing

Small-signal modeling basic square-wave converters
- State-space averaging
- Method of injected/absorbed currents

Feedback loop design
- Fundamentals of stability analysis
- Feedback loop design for phase/gain margin
- Feedback loop design for transient response

WHO SHOULD ATTEND

The seminar is intended for the engineer who is relatively new to the dc/dc converter field or who needs to refresh his/her knowledge about the selection, operation and design of dc/dc converters.

SEMINAR