SEMINAR

Seminar 7 Sunday June 17, 2001

Updated Version

SWITCHMODE MAGNETICS DESIGN - DESIGN CONSIDERATIONS FOR HF LINEAR MAGNETICS 9:00am - 6:00pm

Instructor: Bruce Carsten, Bruce Carsten Assoc., USA

ABOUT THE INSTRUCTOR

The instructor has 29 years of design and development experience in the switchmode field, and understands the pragmatic needs of the harried design engineer. These practice oriented seminars emphasize an intuitive understanding of the phenomena involved, with many rules-of-thumb and aids to visualization. Math is kept to a minimum, with just enough equations to quantify effects wherever possible.

CONTENTS

This one-day-course discusses many of the important aspects of magnetics design that the text books often don´t tell you, with HF conductor losses covered in a separate seminar. Although the basics are quickly reviewed, some experience with magnetics design is assumed. New material in this seminar explores the relative merits of various low profile transformer geometries at high frequencies. Other topics include:

- **Transformer Leakage Inductance; what it is and is not**
- **Common Mistakes in Measuring Leakage Inductance**
- **Measurement of Inter- and Intra-Winding Capacitance**
- **Maximizing Inductor Energy Storage**
- **Flux Shunts for High Leakage Inductance Transformers**
- **Thermal Management Techniques**
- **Multi Leg Cores for “Fractional Turn” LV Outputs**
- **Electrostatic Shields for Reduced Common Mode Noise**
- **Stray Magnetic Fields**
  - Leakage Inductance Fields
  - External Core Air Gaps
  - Non-Uniform Windings on Toroidal cores
  - “Normal Mode” Fields around Common Mode Inductors
  - Flux Straps for Reducing Stray Magnetic Fields
- **Scaling laws and Maximizing Performance**
  - LF Domain (Core Flux is Saturation Limited)
  - MF Domain (Core Flux is Loss Limited)
  - HF Domain (Winding Thickness is Eddy Current Limited)

WHO SHOULD ATTEND

Magnetics designers wanting to upgrade their skills, and switchmode power converter designers, who need a better understanding of magnetic devices.