

Organisational information

For registration please use the registration form which is available on the ECPE web page: www.ecpe.org
> ECPE Events > ECPE Tutorial: Passives in Power Electronics > Registration Form

www.ecpe.org/ecpe-events

Deadline for registration:

- **29 August 2018**

Participation fee:

- **€ 550,-** * for industry
- **€ 435,-** * for universities/institutes
- **€ 150,-** * for students/PhD students
(copy of student ID requested)
(limited number only)
(optional dinner: € 50,- extra fee)

* plus 25 % Danish VAT

- The participation fee includes dinner, lunch, coffee/soft drinks and handouts. Students/PhD students can book the dinner for an extra fee of € 50,-*.
- With the confirmation of registration by email you are registered for the workshop and the invoice will be sent by post.
- 25 % discount for each participant from ECPE Member Companies.
- Further information (hotel list and maps) will be provided after registration and is available on the ECPE web page.
- In case of cancellation later than two weeks before beginning or non-attendance 50 % of the participation fee is payable.
- The number of participants is limited to 35 attendees.

Organisational information

Organiser	ECPE e.V. 90443 Nuremberg, Germany www.ecpe.org
Chairmen:	Prof. Ger Hurley, National University of Ireland, Galway Dr. Ziwei Ouyang, Technical University of Denmark
Organisation	Ingrid Bollens, ECPE e.V. +49 (0)911 / 81 02 88 – 10 Ingrid.bollens@ecpe.org
Venue	Technical University of Denmark (DTU) Anker Engelunds Vej 1 Building 101A, Meeting Centre, Meeting room 1, 1 st floor DTU Lyngby Campus 2800 Kgs. Lyngby/Copenhagen Denmark



Further information (hotel list and maps) will be provided after registration.

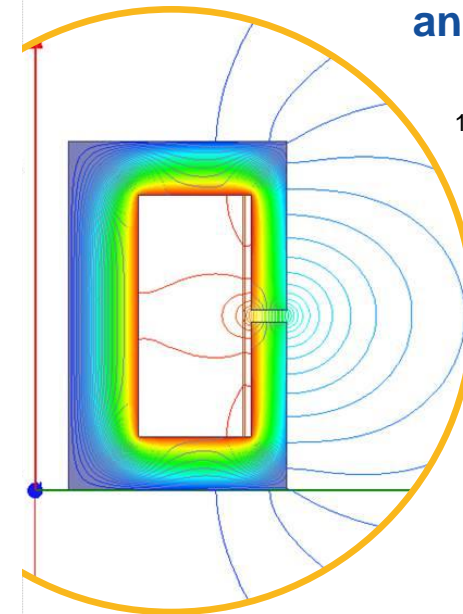


ECPE Tutorial

Passives in Power Electronics: Magnetic Component Design and Simulation

10 – 11 September 2018

Technical University
of Denmark (DTU)
Lyngby/Copenhagen,
Denmark



ECPE Tutorial

Passives in Power Electronics: Magnetic Component Design & Simulation

10 – 11 September 2018
Copenhagen, Denmark

Today, high efficiency and high power density converters are fundamental to the continued profitable growth of the telecommunications, automotive, aerospace and data processing industries. High-frequency operation can lead to a reduction in magnetics size and an increase in power density. The tutorial begins with the fundamentals of magnetic component design for inductors and transformers. Inductor design methodology includes multiple coil inductors such as the flyback converter. This is followed by transformer design, optimized for core and winding loss by proper selection of the maximum operating flux density based on the core loss properties. The winding is further optimized for high frequency loss with non-sinusoidal currents. Fringing, interleaving and litz wire are also covered. Practical designs include forward, pushpull and LLC resonant converters.

A sound understanding of different material properties is crucial for a proper choice of magnetic cores. Therefore, the 2nd tutorial day starts with an in-depth overview and classification of industrially available permeable materials with a focus on high frequency applications.

A simulation approach and the numeric models will be presented in order to allow an easy application of the tutorial contents to power magnetic component designs.

The tutorial concludes with the discussion of planar magnetics. Planar magnetics fabrication processes have several advantages over conventional magnetics: low profile, automated assembly and predictable parasitics amongst other. They also lend themselves to integrated magnetic solutions. Planar magnetic components are particularly suited to wireless power transfer because of their low profile.

Course instructors:

Prof. Ger Hurley, Nat. Univ. of Ireland, Galway, Ireland
Dr. Ziwei Ouyang, Technical University of Denmark
Prof. Roberto Prieto, Univ. Politécnica de Madrid, Spain
Jun Chao Sun, Bs & T, Germany
Dr. Werner Wölfle, Traco Power Solutions, Ireland

All presentations and discussions will be in English.

Programme

Monday, 10 September 2018

10:00 Start of Registration

10:30 Welcome, Introduction

Ingrid Bollens, ECPE e.V.
Michael Andersen, Techn. University of Denmark
Ger Hurley, National Institute of Ireland

10:45 Magnetics Design

Ger Hurley

- Review of fundamentals
- Inductor design
- Transformer design

12:45 Lunch

13:45 Practical Applications in Power Supply Design

Werner Wölfle

- Inductor design: forward converter, flyback converter
- Transformer design: pushpull and LLC resonant converter

15:45 Coffee break

16:05 High Frequency Considerations

Ger Hurley

- High frequency calculations for winding losses and core losses
- Fringing
- Interleaving
- Litz wire

17:15 Open questions from the 1st day

17:30 End of 1st day

17:45 – Optional: Lab tour at DTU ELE group

18:45

20:00 Dinner at 'Restaurant Jægerhuset'
Dronninggaards Allé 126, 2840 Holte DK

Programme

Tuesday, 11 September 2018

09:00 High Frequency Materials for Advanced Magnetics

JC Sun

- An overview: ferromagnetic basics and industrially produced soft magnetic materials
- Characterisation of soft magnetic properties (alloy, ceramic and composites)
- Systematic approach for material choice to design inductive component with examples

10:30 Coffee break

11:00 Modelling and Simulation of Magnetic Components

Roberto Prieto

- 1D and 2D/3D models
- Simulation and design tools
- Practical issues: measurements vs models and sensitivity of constructive parameters
- Simulation of 2D and 3D magnetic components using FEA tools

13:00 Lunch

14:00 High Frequency Planar Magnetics for Power Conversion

Ziwei Ouyang

- Overview of planar magnetics
- High frequency eddy current effects: Interleaved windings, Parallel Windings
- High frequency leakage inductances
- Winding capacitances
- Magnetics integration

15:30 Final Discussion

15:45 End of Tutorial