Organisational Information

Sign up at: www.ecpe.org/events

Registration Deadline:
11 September 2024

Participation Fee:

€ 345,– *	for industry
€ 305,– *	for universities/institutes
€ 135,– *	for students/PhD student (limited spaces; copy of students ID required)

*** plus VAT**

- The online participation fee includes remote access via the meeting software Webex and digital proceedings.
- Digital proceedings will be provided by download link latest one day before start of the event.
- Upon receipt of registration confirmation via email you are signed-up for the event. The invoice will be sent via email.
- ECPE members are able to register 1 participant free of charge, 25% discount for further participants.
- 10% discount on university/institute fee for participants from ECPE competence centres.
- Dial in information for attending by Webex will be provided with the confirmation of registration.
- Cancellation policy: Full amount will be refunded in case of cancellation upon to 2 weeks prior to the event. After this date 50 % of the fee is non-refundable (replacement is possible).

Organisational Information

Organiser	ECPE e.V. Ostendstraße 181 90482 Nuremberg, Germany www.ecpe.org
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Course Instructors

Hans-Peter Feustel, Consultant (DE)

Prof. Dr. Wulf-Toke Franke,
Danfoss Power Electronics and Drives (DK)

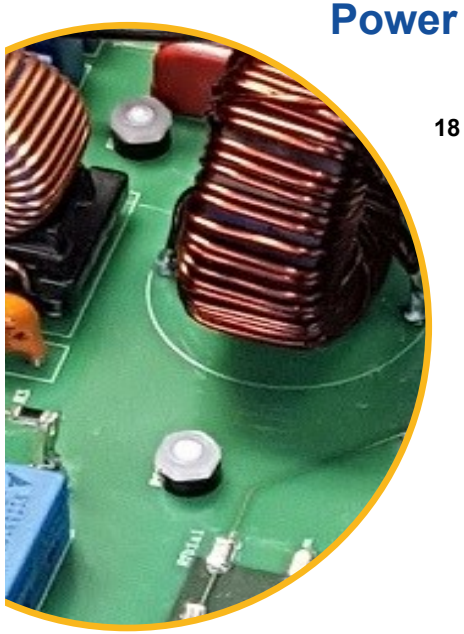
Source front graph : Wulf Toke Franke, University of Southern Denmark

European Center for Power Electronics e.V.

Online Event

ECPE Tutorial

Introduction to Power Electronics



18 - 19 September 2024

ECPE Tutorial

Introduction to Power Electronics

18– 19 September 2024

With the advance of automation and increasing demands on energy efficiency, many industrial applications use closed-loop controlled drives based on power electronics. Power electronics also play a key role in feeding renewable energies from photovoltaic and wind power into the grid as well as coupling different voltage systems, e.g. battery energy storage systems. This also applies to electromobility, both on the vehicle side with the drive converter and various power-electronic converters in the car, as well as on the grid side with the charging infrastructure, e.g. for DC fast charging.

The aim of the training is to convey the basic structure and above all the behaviour of power electronic components and circuits. The important circuit topologies are discussed and their use in various applications is shown.

The training is aimed at scientists, engineers and technicians who have no background in electrical engineering and especially in power electronics, and who want to acquire general knowledge of the basic behaviour and characteristics of power electronics. On the other hand, the training is also intended for users of power electronics who work more on a system level. Here the knowledge of the basics of power electronics helps to make the right decisions and measures.

Course Instructors:

Hans-Peter Feustel, Consultant (DE)
Prof. Dr. Wulf-Toke Franke,
Danfoss Power Electronics and Drives (DK))

All presentations and discussions will be in English.

Programme Overview

1. **Electronic Basics**
2. **General Basics of Power Electronics**
   - a. Components of Power Electronics
     - i. Passives
     - ii. Semiconductors
   - b. Principle of converters
   - **c.** Switching Process
   - **d.** Gate Drive
3. **Circuit Topologies**
   - **a.** DCDC Converter
     - i. Not galvanically isolated
     - ii. Galvanically isolated
   - **b.** ACDC Rectifier
     - i. Diode rectifier
     - ii. Active rectifier, PFC
     - iii. Thyristor circuits
   - **c.** DCAC Inverter
     - i. Basics and control principles
     - ii. Currents in transistors, diodes and DC link capacitors
4. **EMC Considerations**
   - a. Introduction
   - b. EMC in power electronics
   - **c.** Design principals
5. **Assembly Concepts**
   - a. Electrical design considerations
   - **b.** Thermal assembly concepts
6. **Applications**
   - **a.** Automotive
   - **b.** Industry
   - **c.** Solar
   - **d.** Wind power
7. **Summary and Discussion**

Programme

Wednesday, 18 September 2024

08:50	**Webex started**
09:20	**Welcome, Opening** ECPE e.V.
09:30	**Basics of Power Electronics**
10:15	**Components of Power Electronics I**
10:45	**Coffee Break**
11:05	**Components of Power Electronics II**
13:00	**Lunch Break**
14:00	**Principle of Converters**
15:10	**Coffee Break**
15:30	**Switching Process and Gate Drive of Power Semiconductors**
17:20	**End of 1st Day**

Thursday, 19 September 2024

08:45	**Webex started**
09:00	**Start of 2nd Day**
09:00	**Circuit Topologies**
11:10	**Coffee Break**
11:30	**EMC Considerations**
12:15	**Assembly Concepts I**
13:15	**Lunch Break**
14:15	**Assembly Concepts II**
15:15	**Coffee Break**
15:30	**Applications**
16:45	**Summary and Discussion**
17:00	**End of Tutorial**