

Organisational Information

Sign up at: www.ecpe.org/events

Registration Deadline:

16 April 2021

Participation Fee:

- € 395,- * for industry
- € 290,- * for universities/institutes
- € 120,- * for students/PhD student (limited spaces; copy of students ID required)

* plus VAT

- The participation fee includes lectures and digital proceedings (provided 1 day prior to the event by email).
- Participation by web conference tool (Webex). Access data will be provided by email.
- Upon receipt of registration confirmation via email you are signed-up for the event. The invoice will be sent via email.
- Three participants from each ECPE member company free of charge. Allocation in sequence of registration.
- 10% discount on university/institute fee for participants from ECPE competence centres.
- Cancellation policy: Full amount will be refunded in case of cancellation up to 1 week prior to the event. After this date and in case of no-show 50 % of the fee is non-refundable (substitutes are accepted anytime).

22/03/21

Organisational Information

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Technical Chairmen



Prof. Thomas Ebel, SDU University of Southern Denmark, Sonderborg (DK)



Prof. Huai Wang, Aalborg University (DK)



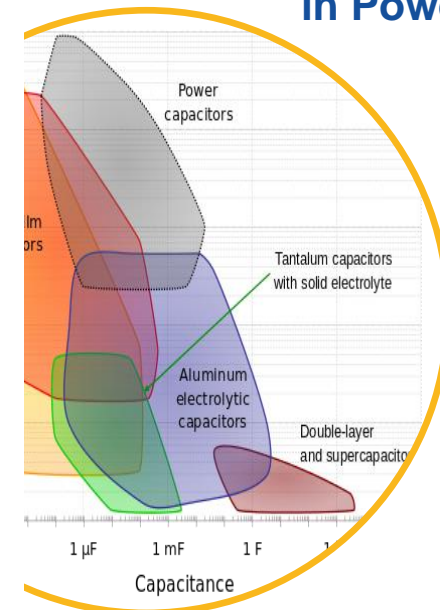
European Center for Power Electronics e.V.

Digital Event

ECPE Online Workshop

Capacitors in Power Electronics

20 – 21 April 2021



in cooperation with



Capacitors in Power Electronics

20 – 21 April 2021
Digital Event

The main focus in the research areas in power electronics has been on active devices, both on power semiconductors and on the integration of control, protection and driving circuits with the main switches. Due to the already achieved progress in this field a further miniaturisation and increase in power conversion efficiency is more and more expected from the passive components. Furthermore, new demands and challenges related to higher switching frequencies and higher power densities and temperatures arise from the use of the wide bandgap semiconductors SiC and GaN.

The available capacitor technologies cover several orders of magnitude in the C-V space. In power electronics involving high voltages and high energy, Al electrolytic and film capacitors are mainly used, and ceramic capacitors for the lower power range only.

The main goal of this workshop is to bring together experts from industry and university to present and discuss the current trends and the new developments related to the field of capacitor device technology. Improvements in the design of capacitive components can be expected from new materials and technologies, from innovative cooling concepts, but also from better understanding and improved analysis of the underlying loss mechanisms.

The workshop is chaired by:

Prof. Thomas Ebel, SDU University of Southern Denmark, Sonderborg (DK)

Prof. Huai Wang, Aalborg University (DK)

All presentations and discussions will be in English.

Programme

Tuesday, 20 April 2021

08:30 Webex will be started

Session 1: Introduction Key Note

09:00 **Introduction to the Workshop**
Chris Gould, Thomas Ebel, Huai Wang

09:15 **Ceramic Capacitor Market Trend in Power Application Market - Next Challenge to Future**
Satu Lipponen, Takanori Hibino, Murata (F)

10:00 Break

Session 2: Capacitor Materials and Technologies

10:15 **DC-Link Power Film Capacitors: Product Series and Applications**
Manuel Gómez, David Olalla, TDK Electronics (ES)

10:45 **Design in High Voltage MLCC's Recommendations**
Axel Schmidt, Kemet (D)

11:15 **Advanced MKP Technology (working title)**
Jan Knoch, Electronicon (D)

11:45 **EMI + AC Line Filtering**
Pranjal Srivastva, Kemet (D)

12:15 Lunch Break

13:00 **Pulse/ Snubbers/ Resonant Capacitors - when Ripple Current Requirements Overpower Capacitance**
Pranjal Srivastva, Kemet (D)

13:30 **Improved Thermal Management of DC-Link Capacitors in 48V Hybrid Passenger Vehicles**
Hiroyuki Yamaguchi, Europe Chemi-Con

Session 3: Applications

14:00 **Capacitor Lifetime and Rating Application (CLARA) for Film Capacitors**
David Olalla, TDK Electronics (ES)

14:30 Break

14:45 **Use of Capacitors in Frequency Converters**
Marco Zuccherato, Danfoss (DK)

15:15 **Design of Capacitive DC Links in PE Applications**
Haoran Wang, Aalborg University (DK)

15:45 **Aluminum Electrolytic Capacitors for Future Industrial and Automotive Applications**
Fabio Mello, TDK Electronics (D)

16:15 Break

16:30 **Film Capacitors for Automotive Power Electronics**
Jose Fernandes, Vishay (PT)

17:00 **Power Electronic Capacitors: Technologies, Product Series & Applications**
Christophe Durandet, Vishay (D)

17:30 Final Discussion

17:45 End of 1st Day

Programme

Wednesday, 21 April 2021

08:30 Webex will be started

Session 3/ 4: Applications/ Reliability and Condition Monitoring

09:00 **Lifetime Estimation and Monitoring of Aluminum Electrolytic Capacitors**
Sebastian Schöll, TDK Electronics (D)

09:30 **Reliability of Ceramic Capacitors**
Caroline Andersson, ABB (CH)

10:00 **Effect of Grid Disturbances on DC-link Capacitors in Motor Drive Application**
Dinesh Kumar, Danfoss (DK)

10:30 Break

10:45 **Capacitors for Electric Aircraft and Transportation Electrification**
Patrick Wheeler, University of Nottingham (UK)

11:15 **Capacitor Condition Monitoring or Capacitors for Automotive Applications**
Maawad Makdessi, Kemet (F)

11:45 **Reliability of Polymer Aluminum Electrolytic Capacitors**
Michael H. Azarian, CALCE (Uni. of Maryland) (US)

12:15 Lunch Break

Session 5: Future Trends in Materials & Technologies

13:00 **High Voltage MLCC in Power Applications**
Axel Schmidt, Kemet (D)

13:30 **Recent Developments on DC-Link Power Film Capacitors Technology**
Manuel Gómez, TDK Electronics (ES)

14:00 **Boosting Performance of Electrolytic Capacitors with Conductive Polymer Dispersions**
Udo Merker, Heraeus (D)

14:30 **Advanced High Voltage Silicon Passive Device for Automotive and Power Applications**
Franck Murray, Murata (F)

15:00 Break

15:15 **HV Polymer Aluminium Electrolytic Capacitors**
Thomas Ebel, SDU (DK)

15:45 **Reliability of Silicon-Nitride based High-voltage Monolithic Capacitors**
Tom Becker, Fraunhofer IISB (D)

16:15 **Aluminum Electrolytic Capacitors – New Hybrid-Polymer Technology**
Fabio Mello, TDK Electronics (D)

16:45 Conclusion

17:00 End of Workshop