

Organisational Information

Sign up at: www.ecpe.org/events

Registration Deadline:

- 14 January 2021

Participation Fee:

- € 320,- * for industry
- € 290,- * for universities/institutes
- € 120,- * for students/PhD students (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 letter post.
- ECPE members are able to register 1 participant free of charge, 25 % discount for further participants.
- 10 % discount 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).

Organisational Information

Organiser ECPE e.V.
90443 Nuremberg, Germany
www.ecpe.org

Contact: Ingrid Bollens, ECPE e.V.
+49 911 81 02 88 - 10
ingrid.bollens@ecpe.org



Dr. Martin Rittner, Chair of Tutorial
Robert Bosch (D)



Peter Dietrich
Richardson RFPD Germany (D)



Steffen Ewald
Fuji Electric Europe (D)



Dr. Gábor Farkas
Mentor Graphics (HU)



(v.l.) Frank Heidemann
Mathias Gebhardt
SET (D)



Stefan Schmitt
Semikron Elektronik (D)



Prof. Dr. Markus Thoben,
Fachhochschule Dortmund (D)



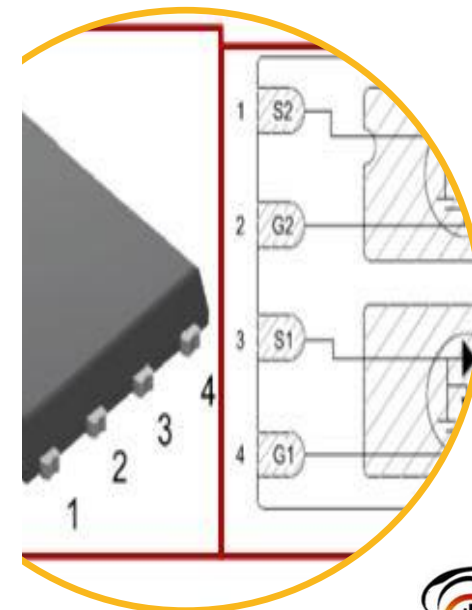
European Center for
Power Electronics e.V.

Digital Event

ECPE Online Tutorial

Testing Automotive Power Modules according to the ECPE Guideline AQG 324

20 – 21 January 2021



ECPE Online Tutorial

Testing Automotive Power Modules according to the ECPE Guideline AQG 324

20 – 21 January 2021

The ECPE Guideline AQG 324 is prepared and released by the ECPE Working Group 'Automotive Power Module Qualification' comprising ECPE member companies from the automotive supply chain. The original version is based on the supply specification LV 324 which has been developed by German automotive OEMs together with representatives from the power electronics supplier industry.

The described tests concern the module design as well as the qualification of devices on module level (i.e. the assembly) but not the qualification of semiconductor chips or manufacturing processes. The requirements, test conditions and tests presented in the tutorial essentially refer to power modules based on Si power semiconductors while wide bandgap power semiconductors (e.g. SiC or GaN) are addressed but not yet fully covered by the Guideline.

The Tutorial with speakers from the AQG 324 Core Team will give practical information and advice how to test power modules according to the AQG 324 Guideline under comparable conditions. It aims at direct users from beginners to senior experts coming from power module suppliers, automotive tier 1 suppliers or test service and equipment providers.

Course Instructors:

Peter Dietrich, Richardson RFPD Germany
Steffen Ewald, Fuji Electric Europe
Dr. Gábor Farkas, Mentor Graphics
Frank Heidemann, Mathias Gebhardt, SET
Dr. Martin Rittner, Robert Bosch
Stefan Schmitt, Semikron Elektronik
Prof. Dr. Markus Thoben, Fachhochschule Dortmund

All presentations and discussions will be in English.

Programme

Wednesday, 20 January 2021

09:30 Webex will be started

10:00 Welcome, Opening

Thomas Harder, ECPE e.V.

10:15 Introduction and Motivation

Martin Rittner/Peter Dietrich

- Background LV 324 and motivation for qualification guideline for power modules
- Definition of terms
- Scope of AQG 324 and module definition

11:00 Mapping of Relevant Standards

Frank Heidemann

- Overview on relevant standards
- Different understandings (Europe, Asia, US)

11:30 Break

11:45 Characterizing Module Testing

Steffen Ewald (electrical testing),
Gábor Farkas (thermal testing)

- Overview on chapters 6 and 7 of AQG 324 with explanations (why and how)

12:45 Lunch

13:30 Lifetime Testing: Power Cycling

Markus Thoben

- Chapter 9.2: QL-01 Power cycling (PCsec)
- Chapter 9.3: QL-02 Power cycling (PCmin)

14:45 Break

15:00 Lifetime Testing: Temperature Tests

Stefan Schmitt

- Chapter 9.4: QL-03 High-temp. storage (HTS)
- Chapter 9.5: QL-04 Low-temp. storage (LTS)
- Chapter 8.2: QE-01 Thermal shock test (TST)

16:30 Open Discussion on Lifetime Testing

PC for SiC-modules, combined testing

17:30 End of 1st Day

Programme

Thursday, 21 January 2021

08:30 Webex will be started

09:00 Lifetime Testing: HTRB and HTGB

Mathias Gebhardt

- Chap. 9.6: QL-05 High-temp. reverse bias (HTRB)
- Chap. 9.7: QL-06 High-temp. gate bias (HTGB)

10:15 Break

10:30 Lifetime Testing: H3TRB and dyn. Test

Stefan Schmitt

- Chap. 9.8: QL-07 High-humidity, high-temp. reverse bias (H3TRB)

11:30 Open Discussion

incl. outlook on dynamic testing

12:15 Lunch

13:00 Mechanical Tests

Martin Rittner

- Chapter 8.4: QE-03 Vibration (V)
- Chapter 8.5: QE-04 Mechanical shock (MS)

13:45 Test Documentation

Stefan Schmitt

- Example of a documentation set
- Number of samples/modules for the tests

14:30 Break

14:45 Outlook

Peter Dietrich

- SiC and GaN based power modules in AQG 324 with WBG challenges
- Advanced module packages in AQG 324 e.g. PCB embedding

15:15 Wrap up, Final Discussion

15:45 End of Tutorial