

Tutorial Proposal

1. Tutorial Title

Thermographic Testing as a Basis for Efficient Usage of Power Electronics

2. Instructor Team: name(s), affiliation(s), and contact information

Torsten König

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3. Abstract (No more than 500 words. Accepted abstract will be published through the conference website, program, and proceedings.)

Thermographic measurements can provide qualified data of the thermal stress single components as well as complete systems may undergo in operations. A sensible test set-up is influenced by the high energy density of modern power electronic materials, the small component sizes and the need for high switching speeds in distribution systems. Various hands-on test examples will be used to explain step-by-step the critical success factors for such measurements. Thereby the participants shall be empowered to fruitfully apply thermography in their specific power electronics research based on a sound understanding of the physical basics of the measurement technology.

4. Tutorial Outline (Outline shall only define the topics and subtopics. No detailed descriptions please. Time allocation and instructor breakdown by topics is recommended.)

1. Spatial resolution influencing the measurement precision and ways to achieve a sufficient set-up (30 min)
2. Time resolution of the measurement system being dependent on detector solutions– ways to work with enhanced solutions (20 min)
3. The importance of thermal resolution for component testing and improvements by lock-in thermography (40 min)
4. Various measurement specific topics (40 minutes)

Handling material emissivity in practical electronics testing
Qualitative vs. quantitative thermography
Complex test set-ups with synchronization and triggering

Schedule:

08:30-9:30: Introduction / Theme1

10:00-10:30: Coffee break

10:15-11:40 Theme / Conclusions

5. Lecture Style and Requirements

The tutorial is to be a hands-on seminar where practical measurement examples will be carried out live using demonstrators for the various topics to be discussed. Therefore needed are:

- projector to be connectable with computer via HDMI
- large table for setting up demonstrators (as some of them are small it would be helpful if participants have the chance to come closer)
- stable table for demonstrating close-up thermal imaging
- power access :-)

The target audience are researchers wanting to successfully apply thermography as a means to produce thermal data of a component level as well as for complete systems. This data could be used as a basis for complex simulations of thermal behaviour of the systems as well as to verify the actual set-up which were made based on previous simulations. Also live testing of systems being installed at running distribution networks might be interesting for establishing prediction models of the systems reliability.

6. Instructor Biography

Dipl.-Wi.-Inform. Torsten König, born in 1968, studied business informatics at the University of Lüneburg. After graduating, he initially stayed connected to his original field of knowledge and worked in a wide variety of functions for the Otto Group, for PENTAX and for the Arcor/Vodafone Group. In 2009 he moved to InfraTec GmbH, where he took on the task of selling thermographic products and solutions. In this function, he expanded his field of activity and dealt intensively with infrared thermography. As a specialist in this field, his tasks include the development of specific-customer- solutions, presentation of thermographic measurement and testing technology and the management of thermography workshops. Torsten König is a Level 1 certified thermographer since 2015. He is responsible for project management for Northern Germany and Denmark and supports users in the use of cooled and uncooled thermography systems.