

Program

THERMINIC Live Day 23.09.2021

8:30 – 8:55 **MEET US FOR A COFFEE IN WONDER.ME**

9:00 – 9:10 **WELCOME ON BEHALF OF THE ORGANISING COMMITTEE AND IEEE**

9:10 – 10:00 **KEYNOTE**

Chair: Bernhard Wunderle, TU Chemnitz

The Challenge of Thermal and Mechanical Design of Power Electronics for BEV (Battery Electric Vehicles)

Dr. Markus Klingler – Robert Bosch GmbH

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10:00 – 10:45 **SESSION 1: THERMAL CHARACTERISATION I**

Chair: Bernhard Wunderle, TU Chemnitz

Measurement and Simulation of the Three-dimensional Temperature Field in an RF SOI Chip

Isaac Haik Dunn – ESYCOM lab, Univ Gustave Eiffel, CNRS, Marne-la-Vallée, France

Suggestions for Extending the Scope of the Transient Dual Interface Method

András Poppe – BME, Budapest, Hungary; SIEMENS DI SW, Budapest, Hungary

Thermal Analysis of SiC Power Semiconductor Packages Using the Structure Function

Salvatore Race – APS - ETH Zurich, Zurich, Switzerland;

10:45 – 10:55 **VENDOR TALK 1 –**

Simcenter for Electronics Thermal: THERMINIC 2021 Update

John Parry, Siemens Digital Industries Software

10:55 – 11:00 **COFFEE BREAK**



11:00 – 11:40 **PRE-RECORDED PRESENTATIONS 1: THERMAL CHARACTERISATION**

Chair: Bernhard Wunderle, TU Chemnitz

Optimization-based Network Identification for Thermal Transient Measurements on LEDs

Nils Jonas Ziegeler – Fachhochschule Südwestfalen, Iserlohn, Germany

Effects of Auto-Calibration Hysteresis

Voon Hon Wong – Siemens Digital Industries Software, Singapore

Clarification of Error Factors in Thermal Impedance Measurement Using SiC-MOSFET Body Diodes Compared to SWITCH MOS

Fumiki Kato – National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan

Measuring the RthJC of Power Semiconductor Components Using Short Pulses*Sujay Singh – On Semiconductor, Phoenix, United States***Thermal Effect on Performance of N-MOSFET Transistor under Pulsed RF Tests***Ahmed Almusallam – Umm Al-Qura University, Mekka, Saudi Arabia***Comparison of GaN HEMTs Thermal Results through Different Measurements Methodologies: Validation with 3D Simulation***Anass Jakani – XLIM, Université de Limoges, Limoges, France***Study of Aging Time Effect on the EMI Evolution of Power RF LDMOS Transistor in DC-DC Buck Converter Circuit***Mohamed Tlig – Université de Sousse, Ecole Nationale d'Ingénieurs de Sousse, Sousse, Tunisia***Impact of a Crack on Heat Flux in a Solder Joint between an Electronic Component Pin and a Printed Circuit Board***Alexander Kozlov – Omsk State Technical University, Omsk, Russian Federation*

11:40 – 12:25

SESSION 2: THERMO MECHANICAL RELIABILITY & FAILURE ANALYSIS*Chair: Daniel May, TU Chemnitz***In-Situ Degradation Monitoring of Sputtered Thin Al Films on Si Cantilevers Inside SEM During Accelerated Stress Testing using Nano-Indenter Actuation and Vibration Loading***Nathanael Jöhrmann – TU Chemnitz, Germany***Towards the Extension of TRIC for Thermo-Mechanical Analysis***Alessandro Di Costanzo – Università Federico II, Naples, Italy***Applying Model Order Reduction to the Reliability Prediction of Power Electronic Module Wirebond Structure***Pushparajah Rajaguru – University of Greenwich, London, United Kingdom*

12:25 – 1:05

PRE-RECORDED PRESENTATIONS 2: RELIABILITY AND FAILURE ANALYSIS*Chair: Daniel May, TU Chemnitz***A Parametric Simulative Study for Si and SiC Semiconductor Devices Under Various Accelerated Testing Conditions Using Rate- and Temperature Dependent Inelastic Material Data***Freerik Forndran – Vitesco Technologies Germany GmbH, Berlin, Germany;***Reliability of SAC+ Solders for LED Packages***Gordon Patrick Rudolf Elger, Maximilian Schmid – Technische Hochschule Ingolstadt, Ingolstadt, Germany***Rapid Failure Analysis of Installed LED Luminaire Trough Standardized Processes***János Hegedűs – Budapest University of Technology and Economics, Budapest, Hungary***PV Fault Detection through IR Thermography: Using EMPHASIS under Uneven Environmental Conditions***Ciro Scognamillo – University of Naples Federico II, Naples, Italy***Research on Heat Dissipation Performance and Long-term Reliability of the Flapping Wing Cooling Technology Applied to the 5G Communications Equipment***Yanhua Guo – Zhongxing Telecommunication Equipment(ZTE) Corporation, ShenZhen City, People's Republic of China*

Indirect In-Situ Junction Temperature Measurement for Condition Monitoring of GaN HEMT Devices during Application Related Reliability Testing

Sybille Ofner – KAI GmbH, Villach, Austria

Investigation of the Effect of PCB Inner Copper Layer Plastic Deformation on Solder Joint Fatigue Simulations for Cyclic Mechanical Bending Stress Tests

Maofen Zhang – Infineon Technologies AG, Neubiberg, Germany

Comparison of Experimental and Estimated Fusing Current of Gold (Au) and Copper (Cu) Bonding Wires in Semiconductor IC Packages

Randolph Estal Flauta – Nexperia, Hong Kong S.A.R., China

1:05 – 1:50 **LUNCH - MEET US IN WONDER.ME!**

(••) 1:50 – 2:00 HONOURING THE MEMORY OF PROF. VLADIMIR SZEKELY

Marta Rencz, Budapest University of Technology & Economics

2:00 – 2:45 **SESSION 3: THERMAL CHARACTERISATION II**

Session Chair: Mohamad Abo Ras, Berliner Nanotest und Design GmbH

Single Phase Passive HydroCarbon Immersion Cooling of High-power ICs

Wendy Luiten – WLC, The Netherlands

Thermo-fluidic Characterisation of Automotive LIDAR Module under Realistic Enforced Air-cooling Conditions in a Closed Wind Tunnel

Majid Tavakolibasti – Chemnitz University of Technology, Chemnitz, Germany

Evaluation of Failure Mechanisms in Low Thermal Resistance Interface Materials for Reliable Electronics Applications

Karen Wilken – Momentive Performance Materials GmbH, Leverkusen, Germany

2:45 – 2:55 **VENDOR TALK 2 –**

Huawei Vision-driven Research Initiatives: Thermanic 2021 Update

Vadim Tsoi, Huawei



2:55 – 3:35 **PRE-RECORDED PRESENTATIONS 3: THERMAL MODELING**

Chair: Mohamad Abo Ras, Berliner Nanotest und Design GmbH

Modeling of Thermal Exchange in Photovoltaic Module (PV) Lamination Process: Impact of Module Packaging, Laminator Configuration and Lamination Recipe

Bertrand Chambion – Univ. Grenoble Alpes, CEA, LITEN, Department for Solar Energy, National Institute of Solar Energy, Le Bourget du Lac, France

Compact Electro-Thermal Models for Integrated Systems

Lorenzo Codecasa – Politecnico di Milano, Mailnad, Italy

Comparative Multiphysics Simulation of VO2 Based Lateral Devices

Salam A. W. Al-abassi – Budapest University of Technology and Economics, Budapest, Hungary

Thermal Simulation of Processing-in-Memory Devices Using HotSpot 7.0

Jun-Han Han – University of Virginia, Charlottesville, United States

Applying Delphi-like CTM Partitioning on Electrothermally Connected FANTASTIC BCI-ROMs

Mahmood Alkhenaizi – Digital Industries Software Siemens Alseef, Bahrain

Molecular Dynamics Simulations Supporting the Development of a Continuum Model of Heat Transport in Nanowires

Igor Bejenari – Fraunhofer IISB, Erlangen, Germany

Multiphysics Reduced Order Modelling of a Packaged Laser Diode

Giovanna Grosso – Silicon Austria Labs, Austria

TONIC: TOOl for Nonlinear BCI CTMs of Integrated Circuits

Lorenzo Codecasa – Politecnico di Milano, Milan, Italy

AI-TWILIGHT: AI-digital TWIn for LIGHTing – A New European Project

Genevieve Martin – Signify (Philips Lighting), Eindhoven, The Netherlands



3:35 – 4:05

SESSION 4: LIQUID COOLING

Chair: Ralph Schacht, Brandenburgische Technische Universität Cottbus-Senftenberg

Liquid Cooling Solutions for Automotive HPC: Experimental Thermo-Fluidic Characterisation

Tobias Grün – TU Chemnitz, Chemnitz, Germany

Embedded Microchannel Cooling for Monolithically-integrated GaN Half-bridge ICs

Remco van Erp – EPFL, Lausanne, Switzerland

4:05 – 4:10

COFFEE BREAK 2

4:10 – 4:20

VENDOR TALK 3 – FUTURE FACILITIES

Tom Gregory, Future Facilities



4:20 – 4:50

PRE-RECORDED PRESENTATIONS 4: THERMAL PHENOMENA, MATERIALS AND COOLING CONCEPTS

Chair: Ralph Schacht, Brandenburgische Technische Universität Cottbus-Senftenberg

Thermal Fluid Simulation Modeling and Fatigue Analysis of Double-Sided Cooling Power Module Based on Thermal Transient Test

Tomoaki Hara – Siemens DI Software, Presales Division, Siemens K.K., Tokyo, Japan

Study of the Thermal Behavior of Double-sided Cooled Power Modules

Antonio Pio Catalano – University of Naples “Federico II”, Naples, Italy

Application of Vanadium Dioxide for Thermal Sensing

Mahmoud Darwish – Department of Electron Devices, Faculty of Electrical Engineering and Informatics, Budapest University of Technology and Economics, Budapest, Hungary

Impact of Ambient Temperature Influences on the Cooling Performance of a Heat Sink under Forced Air Convection

Ralph Schacht – Brandenburg University of Technology Cottbus-Senftenberg, Cottbus, Germany

A Comparison of the Thermohydraulic Performance of Oil-Cooled Heat Sink Geometries for Power Electronics

Jana Rogiers – Ghent University, Gent, Belgium; FlandersMake@UGent – Core lab EEDT-MP, Gent, Belgium

Thermal Diode Based on the Spatiotemporal Modulation of Thermal Properties

Jose Ordonez – LIMMS, CNRS, Tokyo, Japan; Institute of Industrial Science, The University of Tokyo, Tokyo, Japan

- (•)** **4:50 – 5:00** **VENDOR TALK 4 – NANOTEST**
Cutting-Edge Solutions for Thermal Characterization, Test Vehicles and Failure Analysis
Tobias von Essen, Nanotest
- 5:00 – 5:45** **SESSION 5: NOVEL COOLING CONCEPTS & MATERIALS**
Chair: Corinna Grosse-Kockert, Berliner Nanotest und Design GmbH
- Acoustically-Enhanced Condensation Heat Recovery in Stratified Flows**
Thomas R. Boziuk – Georgia Institute of Technology, Atlanta, United States of America
- Utilizing Additive Manufacturing to Enhance Two-Phase Heat Transfer Devices**
Wessel W. Wits – University of Twente, Enschede, Netherlands; 2Thales Nederland B.V., Hengelo, Netherlands
- Multi-physics Modeling of a Power Electronics Package with Integrated Cooling**
Ahmet Mete Muslu – Georgia Institute of Technology, Atlanta, United States of America
- 5:55 – 6:00** **AC: AWARD CEREMONY**
Chair: John Janssen, NXP Semiconductors
- 6:00 – 6:10** **CLOSING OF CONFERENCE**
Chair: Bernhard Wunderle, TU Chemnitz