THERMINIC 2024

((30th INTERNATIONAL WORKSHOP
Thermal Investigations of ICs and Systems))

SEPTEMBER 25 – 27, 2024 | TOULOUSE, FRANCE

PROCEEDINGS 2024

ORGANIZED BY

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WELCOME TO THERMINIC 2024!

The 30th THERMINIC Workshop is, again, the main European event for academics and industry to share recent advancements in thermal challenges and solutions for electronics, microelectronics, power electronics and solid-state lighting, including aspects of heat transfer at different scales, thermal testing and modelling, simulation, advanced thermal management solutions, reliability and life-time prognostics.

Following the workshops held in Grenoble (1995), Budapest (1996, 2000, 2007, 2012 and 2016), Cannes (1997 and 1998), Rome (1999), Paris (2001, 2011 and 2015), Madrid (2002), Aix-en-Provence (2003), Sophia Antipolis (2004), Belgirate (2005), Nice (2006), Rome (2008), Leuven (2009), Barcelona (2010), Berlin (2013), Greenwich (2014), Amsterdam (2017), Stockholm (2018), Lecco (2019) and two online workshops during the pandemic (2020, 2021) followed by Dublin (2022) and Budapest (2023),THERMINIC is taking place in Toulouse, France, for the first time this year. We are excited to continue the THERMINIC tradition and provide opportunities for personal interactions and to learn more about European research projects related to thermal and reliability issues, such as the AI-TWILIGHT H2020 ECSEL project.

The 30th THERMINIC Workshop once again features a strong technical program, with three exciting keynote presentations, 34 oral and 21 poster presentations organized in 10 oral sessions and 2 poster introduction sessions. More than 100 conference delegates from 18 countries are joining us this year.

This programme booklet has been designed as a navigator for your THERMINIC 2024 participation. It includes all the sessions, presentations, and evening events to help make the most of your stay in Toulouse. Note that the days have been color-coded for easier handling.

We are delighted to welcome five distinguished representatives from industry as keynote speakers at THERMINIC 2024. Renowned experts Frederic Michard (Thales Alenia Space), Jerome Hélie (Vitesco), and Frédéric Marchetto, Werner De Rammelaere and Hélène Calmels from Airbus will showcase current trends in their respective fields of work.

The special session dedicated to the AI-TWILIGHT project will provide an opportunity to exchange ideas between the project consortium and the wider thermal community.

We also have a great evening programme in store for you. The welcome reception on Wednesday evening will be held on a cruise along the Garonne river, taking in the sights of Toulouse. The Thursday dinner will be taking place at the Cité de l'espace, offering a combination of fine dining and an exciting location that leads you into Space!

Our thanks go to the authors for their presentations and posters, as well as to the members of the scientific committee for soliciting and selecting the right mix of contributions. We are also very grateful to our industry sponsors for their support of THERMINIC 2024. Last not least, we would like to thank the teams from Icam, LAAS CNRS and mcc Agentur für Kommunikation for all their help in the organisation of THERMINIC 2024.

We look forward to an inspiring three days with you at THERMINIC 2024 in Toulouse.

Jean-Pierre Fradin and Patrick Tounsi
Program Chairs

Tim Persoons
General Chair

András Poppe
Vice General Chair

Jean-Pierre Fradin
Program Chair

Patrick Tounsi
Program Chair

John Parry
Publicity Chair

WEDNESDAY OVERVIEW

Wednesday, September 25, 2024

Welcome
🕐 9.30 am – 9.40 am
Jean-Pierre Fradin, Icam, France

Keynote I:
🕐 9.40 am – 10.20 am
Satellite Thermal Control Overview and Challenges
Frederic Michard, Thales Alenia Space
Chair: Jean-Pierre Fradin, Icam

Coffee Break
🕐 10.20 am – 10.50 am

Session 1.1: Power Electronics
🕐 10.50 am – 12.10 pm

Vendoor Session
🕐 12.10 pm – 12.30 pm

Lunch
🕐 12.30 pm – 1.50 pm

Session 1.2: Design & Simulation (I)
🕐 1.50 pm – 3.10 pm

Poster Introduction I
🕐 3.10 pm – 3.50 pm

Coffee Break and Poster Session
🕐 3.50 pm – 4.30 pm

Session 1.3: Design & Simulation (II)
🕐 4.30 pm – 5.30 pm

Walk to Garonne Harbour
🕐 6.15 pm – 6.30 pm

Welcome Reception Cruise on Garonne river
🕐 7.00 pm – 9.00 pm

↑ BACK TO MENUE

Session 1.1: Power Electronics

🕐 10.50 am – 12.10 pm

➔ *Session Chair: Patrick Tounsi, LAAS - CNRS*

10.50 am **Thermal and Thermo-mechanical Behavior of Internal Silver-diamond Heat Spreaders for Power Electronic Modules**
Aitor Casado Ramoneda[1,2], Yvan Avenas[1], Rabih Khazaka[2], Cyrille Gautier[2], Toni Youssef[2]
[1]Univ. Grenoble Alpes, CNRS, Grenoble INP, G²Elab, Grenoble, France; [2]Safran Tech, Electrical & Electronic Systems Research Group, Châteaufort, France

11.10 am **Holistic Thermal Management System Design, Testing, and Modeling for 300 kW IGBT-Based Inverter for Switched Reluctance Motor Drives**
Mohamed Hefny[1], Ahmed Zaghlol[2], Kamal Vaghasiya[1], Rachit Pradhan[1], Mohamed Omar[1], Ali Emadi[1]
[1]McMaster Automotive Resource Centre (MARC)-McMaster University, Ontario, Canada; [2]Innovative Thermal Solutions (ITS), Ontario, Canada

11.30 am **Precise 3D Modelling of SiC Dies Temperature Oscillations for Lifetime Prediction of Power Modules Used in DC/AC Power Converters**
Alexandre Marie[1], Bernardo Cougo[2], Loic Renaudie[1], Tresor Kaounodji Koladoum[1], Jean-Pierre Fradin[1]
[1]ICAM School of Engineering, Toulouse, France; [2]IRT Saint-Exupery, Toulouse, France

11.50 am **Thermo-Mechanical Investigations for PCB Assemblies Using Top-side Cooled Power Devices**
Philip Matzick, Christian Mentin, Lukas Adelbrecht, Elisa Anes Romero, Roberto Petrella
Silicon Austria Labs, Austria

12.10 pm **Vendoor Sessions**
12.30 pm **Lunch**

Session 1.2: Design & Simulation (I)

🕐 1.50 pm – 3.10 pm

➔ *Session Chair: Wendy Luiten, WLC*

1.50 pm **Numerical Investigation of a Novel Lid Design for Automotive HPC Cooling**
Baris Erol[1], Daniel May[1], Bernhard Wunderle[1,2]
[1]Chemnitz University of Technology, Chemnitz, Germany; [2]Fraunhofer ENAS, Chemnitz, Germany

2.10 pm **Experimental Validation of Thermal-Adjoint Topological Optimization for Cooling Plate Design**
Federico Piscaglia[1], Emanuele Gallorini[1], Federico Ghioldi[1], Alexandre Marie[2], Jean-Pierre Fradin[2], Jerome Helie[3]
[1]Politecnico di Milano, Milan, Italy; [2]ICAM, Toulouse, France; [3]VITESCO Technologies, Toulouse, France

2.30 pm **3D-Printed Direct Liquid Multi-Jet Impingement Cooling Solutions for Power Electronics in Electrified Automotive Transportation**
Reza Moloudi[1], Bart Vandevelde[1], Willem Verleysen[2], Silke G. C. Cleuren[2], Lucie Masquelet[3], Maik Sternberg[4], Adrian Stelzer[5], Andreas Burghardt[6], Przemyslaw Jakub Gromala[6]
[1]IMEC, Leuven, Belgium; [2]Materialise, Leuven, Belgium; [3]Sadechaf, Turnhout, Belgium; [4]Nanotest, Berlin, Germany; Nano-Join, Berlin, Germany; [4]Bosch, Reutlingen, Germany

2.50 pm **Lanczos-based Foster-to-Cauer Transformation for Network Identification by Deconvolution**
Nils Jonas Ziegeler[1,2], Stefan Schweizer[1,3]
[1]South Westphalia University of Applied Sciences, Iserlohn, Germany; [2]Hella GmbH & Co. KGaA, Germany; [3]Fraunhofer Application Center for Inorganic Phosphors, Soest, Germany

3.10 pm **Poster Introduction**

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Session 1.3: Design & Simulation (II)

🕐 4.30 pm – 5.30 pm

➔ *Session Chair: Marta Rencz, Budapest University of Technology & Economics*

4.30 pm **THERMEXP: An Efficient Thermal Analysis method via Matrix Exponential**
Pavlos Stoikos, George Floros
University of Thessaly, Thessaly, Greece

4.50 pm **Transient Thermal Simulation of a SiP FO-WLP Embedding a GaN Power Amplifier**
N'doua Luc Arnaud Kakou[1], Raphael Sommet[1], Anass Jakani[2], Khalil Karrame[1], Laurent Brunel[3], Vincent Bortolussi[3], Benoit Lambert[3], Jean-Christophe Nallatamby[1]
[1]XLIM; [2]III-V Lab; [3]UMS

5.10 pm **Static Thermal Model of a Fibre-Optic Gyroscope**
Marcin Janicki, Piotr Zając, Cezary Maj
Lodz University of Technology, Lodz, Poland

7.00 pm – 9.00 pm **Welcome reception cruise on the Garonne River**

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Thursday, September 26, 2024

Keynote II:
🕐 8.20 am – 9.20 am
Airbus Systems Roadmap and the Associated Thermal Challenges for Electronic Equipments
Hélène Calmels, Frédéric Marchetto, Werner De Rammelaere, Airbus
Chair: Jean-Pierre Fradin, Icam

Session 2.1: Thermal Measurement (I)
🕐 9.20 am – 10.20 am

Coffee Break
🕐 10.20 am – 10.50 am

Session 2.2: Thermal Measurement (II)
🕐 10.50 am – 12.10 pm

Lunch and Poster Viewing
🕐 12.10 pm – 1.40 pm

Session 2.3: Convective Two-Phase I
🕐 1.40 pm – 3.00 pm

Poster Introduction II
🕐 3.00 pm – 3.40 pm

Break: Poster Session 2
🕐 4.00 pm – 4.40 pm

Session 2.4: Thermal Measurement (III)
🕐 4.40 pm – 5.20 pm

Visit and gala dinner in Cité de l'espace
🕐 7.00 pm – 10.15 pm

Session 2.1: Thermal Measurement (I)

🕐 9.20 am – 10.20 am

➔ *Session Chair: Tim Persoons, Trinity College Dublin*

9.20 am **Sustainable Immersion Cooling of Servers**
Wendy Luiten[1], John Parry[2], Robin Bornoff[2]
[1]WLC, Breda, The Netherlands; [2]Siemens Digital Industries Software, Newbury, UK

9.40 am **2D Materials for Thermal Raman Measurements on Power Electronic Devices**
Dominique Carisetti[1], Julie Cholet[1], Lucie Frogé[1], Eva Desgué[1], Pierre Legagneux[1], Patrick Garabedian[1], Nicolas Sarazin[1], Pierre Seneor[2], Bruno Dlubak[2], Etienne Carré[2], Marie-Blandine Martin[2], Vincent Renaudin[3], Tony Moinet[4], Raphael Sommet[5]
[1]Thales Research and Technology, Palaiseau, France; [2]Laboratoire Albert Fert, Palaiseau, France; [3]STMicroelectronics, Grenoble, France; [4]STMicroelectronics, Tours, France; [5]XLIM, Brive la gaillarde, France

10.00 am **Performance Assessment of an Advanced Direct-to-chip Liquid Cooling Solution in Real Conditions Inside a Data Centre**
David Beberide[1,2], Desideri Regany[1], Jaume Camarasa[1], Jérôme Barrau[1,2], Montse Vilarrubí[1,2]
[1]Universitat de Lleida, Lleida, Spain; [2]Universal Smart Cooling S.L., Lleida, Spain

10.20 am – 10.50 am **Coffee Break**

Session 2.2: Thermal Measurement (II)

🕐 10.50 am – 12.10 pm

➔ *Session Chair: Vadim Tsoi, Huawei Technologies Sweden AB*

10.50 am **Sensorless Dual TSEP Implementation for Junction Temperature Measurement in Parallelized SIC Mosfet**
Louis Alauzet[1,2], Jean-Pierre Fradin[1], Patrick Tounsi[2]
[1]ICAM School of Engineering, Toulouse, France; [2]LAAS-CNRS, Université De Toulouse, CNRS, INSA

11.10 am **Impact of GaN Cap Layer and Carbon-Doped Buffer Layer on Thermal Resistance of HEMTs GaN**
Khalil Karrame[1], Sujan Sarkar[2], Ramdas Khade[2], Jean-Christophe Nallatamby[1], Maggy Colas[3], Amitava DasGupta[2], Nandita DasGupta[3], Raphael Sommet[1]
[1]Xlim, Limoges, France; [2]Indian Institute of Technology Madras, Chennai, India; [3]Centre Européen de la Céramique, Limoges, France

11.30 am **Transient Electro-thermal Characterisation at Systemlevel for a Easypack-IGBT-Module – Reduced order modelling (ROM) and Junction Temperature Evaluation Based on The on-state Resistance**
Gregor Wiedemann, Tino Lamm, Ralph Schacht
Brandenburg Technical University Cottbus-Senftenberg, Cottbus, Germany

11.50 am **Thermal Conductivity Prediction of Composites by Hybrid Physics-Based and Data-Driven Modeling**
Rudi Steenbakkers
Dow Benelux B.V., Terneuzen, the Netherlands

12.10 pm – 1.40 pm **Lunch**

Session 2.3: Convective Two-Phase I

🕐 1.40 pm – 3.00 pm

➔ *Session Chair: Ralph Schacht, BTU Cottbus-Senftenberg*

1.40 pm **Closed-loop Flow Boiling Cooler Test Stand for Investigations on Future Power Package Designs**
Ralph Schacht[1], J. Ben Majed[1], Tobias Gruen[2], Daniel May[2,3], Mohamad Abo Ras[2], Bernhard Wunderle[3]
[1]Brandenburg University of Technology Cottbus-Senftenberg, Cottbus, Germany; [2]Berliner Nanotest und Design GmbH, Berlin, Germany; [3]Chemnitz University of Technology, Chemnitz, Germany

2.00 pm **Two-phase Pumped Cooling System for Power Electronics; Analyses and Experimental Results**
Henk Jan van Gerner[1], Arne K. te Nijenhuis[1], Changmin Cao[2], Ignacio Castro[2], Douglas A. Pedroso[2], Herol Dsouza[2]
[1]NLR - Royal Netherlands Aerospace Centre, The Netherlands; [2]Collins-ART, Cork, Ireland

2.20 pm **Enabling Overloadability in Power Semiconductor Modules by Pulsating Heat Pipe Coolers**
Reza Soleimanzadeh, Yanfei Zhao, Marcel Fuchs
Hitachi Energy, Switzerland

2.40 pm **Investigation of Aqueous Alcoholic Mixtures as Working Fluids in a Two-phase Pumpless Loop**
Arunjoy Baruah, Shankar Krishnan
IIT Bombay, Mumbai, India

3.00 pm – 4:20 pm **Poster Introduction II** (see page 26) **and Coffee Break & Poster Session II**

Session 2.4: Thermal Measurement (III)

🕐 4.20 pm – 5.20 pm

➔ *Session Chair: Patrick Tounsi, LAAS-CNRS)*

4.20 pm **Raman Thermometry: A Simultaneous Structural And Thermal Characterization Technique For GeSbTe Based Phase Change Materials**
Akash Patil[1,2], Tushar Chakrabarty[1,2], Yannick Le-Friec[2], Jury Sandrini[2], Roberto Simola[3], Simon Jeannot[2], Philippe Boivin[3], Emmanuel Dubois[1], Jean-Francois Robillard[1]
[1]Univ. Lille, Lille, France; [2]STMicroelectronics, Crolles, France; [3]STMicroelectronics, Rousset, France

4.40 pm **Layer Resolved Thermal Impedance Measurement with Laser Stimulated Transient Thermal Analysis of Semiconductor Modules**
Hannes Schwan, Maximilian Schmid, Gordon Elger
Technische Hochschule Ingolstadt, Ingolstadt, Germany

5.00 pm **Thermal Performance Comparison of an Adjustable Air Amplifier with Rotary Fans**
David W. Salter[1,2], Eoin H. Oude Essink[1,2], Gordon O'Brien[2], Tim Persoons[2], Sajad Alimohammadi[1,2]
[1]School of Mechanical Engineering, Technological University Dublin, Ireland; [2]Department of Mechanical, Manufacturing & Biomedical Engineering, Trinity College Dublin, Ireland

6.00 pm – 7.00 pm **Bus to Cité de l'espace**

7.00 pm – 11.00 pm **Conference Dinner at Cité de l'espace**

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Friday, September 27, 2024

Keynote III:
🕐 9.00 am – 9.40 am
Wide Band Gap Integration for Automotive Power Electronic Applications
Jerome Hélie, Vitesco
Chair: Jean-Pierre Fradin, Icam

Session 3.1: AI-TWILIGHT PROJECT
🕐 9.40 am – 10.40 am

Coffee Break
🕐 10.40 am – 11.10 am

Session 3.2: Convective Two-Phase II
🕐 11.10 am – 12.10 pm

Vendor Session
🕐 12.10 pm – 12.25 pm

Lunch
🕐 12.25 pm – 2.00 pm

Session 3.3: Innovative Cooling
🕐 2.00 pm – 3.00 pm

Awards & Closing Remarks
🕐 3.00 pm – 3.30 pm
Chairs: John Janssen, NXP and Jean-Pierre Fradin, Icam

Farewell Coffee Break
🕐 3:30 pm – 3.50 pm

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Session 3.1: AI-TWILIGHT PROJECT

🕐 9.40 am – 10.40 am

➔ *Session Chair: András Poppe, Budapest University of Technology and Economics*

9.40 am **Degradation Mechanisms in High-Power LEDs: Thermal Analysis of Failure Modes**
Nicola Trivellin[1,2], Alessandro Caria[2], Riccardo Fraccaroli[2], Giulia Pierobon[2], Tomas Castellaro[2], Ambrogio Huang[2], Julien Magnien[3], Joerdis Rosc[3], Gyula Lipak[4], Gusztáv Hantos[4], Jozsef Hegedus[4], Carlo De Santi[2], Matteo Buffolo[2,5], Enrico Zanoni[2], Andras Poppe[2], Gaudenzio Meneghesso[2], Matteo Meneghini[2,5]
[1]*Department of Industrial Engineering, University of Padova, Padova, Italy;* [2]*Department of Information Engineering, University of Padova, Padova, Italy;* [3]*Materials Center Leoben Forschung GmbH, Leoben, Austria;* [4]*Department of Electron Devices, Budapest University of Technology and Economics, Budapest, Hungary;* [5]*Department of Physics and Astronomy, University of Padova, Padova, Italy*

10.00 am **Thermal Investigations as Part of a Remote Phosphor Aging Test**
János Hegedüs, Dalma Takács, Gusztáv Hantos, Márton Németh, András Poppe
Budapest University of Technology and Economics, Budapest, Hungary

10.20 am **Reliability Testing of Mid-power LEDs for the Extension of Multi-domain LED Models with Elapsed Lifetime as Parameter**
Gusztáv Hantos, János Hegedüs, Gyula Lipák, Márton Németh, András Poppe
Budapest University of Technology and Economics, Budapest, Hungary

10.40 am – 11.10 am **Coffee Break**

Session 3.2: Convective Two-Phase II

🕐 11.10 am – 12.10 pm

➔ *Session Chair: Bernhard Wunderle, TU Chemnitz*

11.10 am **Thermal Performance and Visualization of the Boiling-driven Heat Spreader**
Su-Yoon Doh[1], Hyunmuk Lim[1], Seung M. You[2], Jungho Lee[1]
[1]*Ajou University, Republic of South Korea;* [2]*The University of Texas at Dallas, Texas, USA*

11.30 am **Comparison Between Single and Two-phase Cooling in a Variable Density Micro-pin-finned Heat Sink**
Jaume Camarasa, Montse Vilarrubí, Desideri Regany, David Beberide, Pol Rosell, Alicia Crespo, Joan Rosell, Manel Ibáñez, Jérôme Barrau
Universitat de Lleida, Lleida, Spain

11.50 am **Enhancing Controllability of Forced Convection Cooling with Minichannel Heatsinks Using Pulsating Flow**
Galina Kennedy, Tim Persoons
Trinity College Dublin, Dublin, Ireland

12.10 pm – 12.25 pm **Vendor Session**

12.25 pm – 2.00 pm **Lunch**

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Session 3.3: Innovative Cooling

🕐 2.00 pm – 3.00 pm

➔ *Session Chair: Jean-Pierre Fradin, Icam*

2.00 pm **Evaporation Resistance of Grooved Wicks Fabricated Using Laser Powder Bed Fusion**
Mohamed Hasan[1], Jason Durfee[2], Roger Kempers[1]
[1]York University, Toronto, Canada; [2]Magna International Inc

2.20 pm **Investigating the Performance of an Additive Manufactured Lattice Heat Sink Versus a Conventional Straight-fin Heat Sink for Railway Application**
Ahmad Batikh[1], Jean-Pierre Fradin[1], Antonio Castro Moreno[2]
[1]Icam School of Engineering, Toulouse, France; [2]IRT Saint Exupéry, Toulouse, France

2.40 pm **Thermal Characterisation and Technology of Intercalated Graphene-Based Nano-Laminates**
Bernhard Wunderle[1], Marc Stevens[3], Daniel May[1], Sascha Hermann[3], Corinna Grosse-Kockert[2], Mohamad Abo Ras[2]
[1]: TU Chemnitz, Chemnitz, Germany; [2]: Berliner Nanotest & Design GmbH, Berlin, Germany; [3]: Fraunhofer ENAS, Chemnitz, Germany

3.00 pm – 3.30 pm **Awards & Closing Remarks**

3.30 pm – 3.50 pm **Farewell Coffee Break**

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Poster Introduction I

🕐 3.10 pm – 3.50 pm

➔ *Session Chair: John Janssen, NXP Semiconductors*

01 **Hotspot-aware Microfluidic Cooling for High TDP Chips Using Topology Optimization**
Athanasios Boutsikakis, Emile Soutter, Miguel A. Salazar de Troya, Nicola Esposito, Dasha Mukasheva, Hanane Bouras, Remco van Erp
Corintis, Switzerland

02 **Optimization of LHP (loop heat pipe) Geometry for Ultra-high Heat Flux Cooling System**
Hee Soo Myeong[1], Seok Pil Jang[1,2]
[1]*Department of Smart Air Mobility, Korea Aerospace University, Goyang-si, Republic of South Korea;* [2]*Department of Aeropace and Mechanical Engineering, Korea Aerospace University, Goyang-si, Republic of South Korea*

03 **Thermal Characterization of Vertical GaN Based Power Devices**
Sandra Fischer, Florian Mayer, Verena Leitgeb, Lisa Mitterhuber, Elke Kraker
Materials Center Leoben Forschung GmbH, Leoben, Austria

04 **Thermal Numerical Modelling of Complex Electronic Devices**
Sophie Salvadori, Mahmoud Ali, Viraj Singh, Amandine Battentier
Slb, France

05 **Extracting Time-Constant Spectra by the Subspace Barzilai and Borwei Non-Negative Least Square Algorithm**
Joosun Yun[1], Byongjin Ma[2], Guesuk Lee[2], Taehee Jung[2], Dong-Soo Shin[3], Youngbeom Kim[1], Hyundon Jung[1]
[1]*EtaMax, Republic of (South Korea);* [2]*KETI, Republic of South Korea);* [3]*Hanyang University ERICA,Ansan-si, Republic of South Korea*

06 **Real-Time State of Charge Estimation of Lithium-Ion Battery Considering Temperature**
Simone Barcellona[1], Lorenzo Codecasa[1], Silvia Colnago[2], Dario D'Amore[1]
[1]*Politecnico di Milano, Milano, Italy;* [2]*Ricerca sul Sistema Energetico, S.p.A., Italy*

07 **ATARI: Advanced Thermomigration Analysis for Reliability-Aware Interconnects**
Olympia Axelou, Eleni Tselepi, George Floros
University of Thessaly, Thessaly, Greece

08 **A Case Study on Exhaust Airflow Rates by the Enclosure Ventilation Fan Structure of a Cast Resin Transformer**
Seongeon Kim, Jaeseop Ryu
LS Electric, Republic of South Korea

09 **Modelling Thermal Properties of Power LEDs Module**
Krzysztof Górecki, Przemysław Ptak
Gdynia Maritime University, Gdynia, Poland

10 **Numerical Investigation on the Thermal Resistance and Assembly Cost in SSC and DSC Power Modules**
Ciro Scognamillo[1], Antonio Pio Catalano[1], Lorenzo Codecasa[2], Alberto Castellazzi[3], Vincenzo d'Alessandro[1]
[1]*University Federico II, Napoli, Italy;* [2]*Politecnico di Milano, Milan, Italy;* [3]*Kyoto University of Advanced Science, Kyoto, Japan*

11 **Electro-Thermal Characteristics Comparison for FinFET, NWFET and NSFET Structures**
Konstantin O. Petrosyants, Denis S. Silkin, Dmitiy A. Popov
National Research University Higher School of Economics, Moscow, Russia

3.50 pm – 4.30 pm **Coffee Break & Poster Session**

Poster Introduction II

🕒 3.00 pm – 3.40 pm

➔ *Session Chair: Ahmad Batikh, ICAM Toulouse*

01 **Channel to Channel Thermal Coupling of Double-Channel GaN-based HEMTs**
Shiming Li, Mei Wu, Ling Yang, Hao Lu, Bin Hou, Meng Zhang, Xiaohua Ma, Yue Hao
Xidian University, Xi'An, China, People's Republic of

02 **Transient Thermal Simulation of a SiP FO-WLP Embedding a GaN Power Amplifier**
N'doua Luc Arnaud Kakou[1], Raphael Sommet[1], Anass Jakani[2], Khalil Karrame[1], Laurent Brunel[3], Vincent Bortolussi[3], Benoit Lambert[3], Jean-Christophe Nallatamby[1]
[1]*XLIM University of Limoges, UMR7252;* [2]*III-V Lab;* [3]*UMS S.A.S*

03 **Electro-thermal Analysis for Automotive LDOs with Reverse Current Protection**
Alessandro Battigelli[1], Cosmin-Sorin Pleșa[2], Marius Neag[1], Gabriel Simeon[2]
[1]*Technical University of Cluj-Napoca, Cluj-Napoca, Romania;* [2]*Infineon Technologies, Bucharest, Romania*

04 **Characterization of the External Thermal Resistance of the Condenser Using the Evaporative Cooling with Porous Medium**
Sungjun Park[1], Seok Pil Jang[1,2]
[1]*Department of Smart Air Mobility, Korea Aerospace University, Republic of South Korea;* [2]*Department of Aerospace and Mechanical Engineering, Korea Aerospace University, Republic of South Korea)*

05 **Thermofluid-dynamic Performance Improvement of Power Electronics Cooling Systems through CFD Analysis**
Radha Russo[1], Daniela Cavallaro[1], Marco Papaserio[1], Emanuela Privitera[1], Stefano Mauro[2]
[1]*STMicroelectronics, Italy;* [2]*University of Catania, Catania, Itlay*

06 **Application of Phase Change Material for Thermal Management of Space Electronics**
Artur Jurkowski, Radosław Paluch
KP Labs, Gliwice, Poland

07 **Extensive Thermal Evaluation to Select Properly the Package Features to Fit the Product Mechanical and Thermal Requirements**
Andrea Garuffo, Donata Gualandris
STMicroelectronics, Italy

08 **Thermal Detection of Degradation in Solder Joints of Passive Components**
Nils Jahn, Martin Pfost
TU Dortmund University, Dortmund, Germany

09 **Novel Approach to the Extraction of Sparse Nonlinear Dynamic Compact Thermal Multi-Ports**
Lorenzo Codecasa[1], Vincenzo d'Alessandro[2], Antonio Pio Catalano[2], Ciro Scognamillo[2], Simone Barcellona[1], Dario D'Amore[1]
[1]*Politecnico di Milano, Milano, Italy;* [2]*Università Federico II, Naples, Naples, Italy*

3.40 pm – 4.20 pm **Coffee Break & Poster Session II**

→ CONTACT

THERMINIC 2024

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