International Workshop on THERMal INvestigations PROGRAMME 2007 of ICs and Systems

THE WORKSHOP AT A GLANCE

Monday 17 **Tuesday 18** September 2007 September 2007 ₩ 8.00 - 9.30 ₩ 8.30 - 9.10 Registration Invited talk 2: ₩ 8.50 - 9.00 **HIGH PERFORMANCE** Welcome address THERMAL INTERFACE TECHNOLOGY ≥ 9.00 - 9.40 **OVERVIEW** Invited talk 1: ▶ 9.10 - 10.30 THERMAL CHALLENGES Session 4: **IN 3-D STACKED** PROGRESS PACKAGING **IN COMPACT** MODELLING ≥ 9.40 - 11.00 THEORY Session 1: TRANSIENT → 10.30 Break THERMAL **CHARACTERISATION 10.50 - 12.30** Session 5: → 11.00 Break **ADVANCES IN COOLING** 11.20 - 12.40 **TECHNOLOGIES** Session 2: RELIABILITY **OF SOLDER JOINTS** → 12.40 Lunch → 12.30 Lunch ≥ 14.00 - 15.50 ≥ 14.00 - 15.40 Session 3: Session 6: MICROSCALE **DEVELOPMENTS** COOLING **IN EXPERIMENTAL** ANALYSIS → 15.50 Break → 15.40 Break 16.10 - 16.50 16.00 - 17.30 **VENDOR SESSION** 16.50 - 17.30 AND STRAINS POSTER IN ELECTRONIC SESSION: INDUSTRY INTRODUCTION **AND VIEWING** → 18.30 Cocktail → 19.00 Social event: cruise on the Danube.

PANEL: THERMALLY INDUCED STRESSES Wednesday 19 September 2007

9.00 - 9.40 Invited talk 3: THERMAL MANAGEMENT AND THERMAL **RESISTANCE OF HIGH POWER LEDs**

▶ 9.40 - 10.40 Session 7: **MULTI-PHYSICS** SIMULATION

→ 10.40 Break

11.00 - 12.00 Session 8: PACKAGE RELIABILITY

→ 12.00 Lunch

Photos DR Printed in France Création Crim



Budapest Hungary > 17 - 19 September 2007

The Workshop is sponsored by the IEEE Components, Packaging, and Manufacturing Technology Society and by CMP.





COMPONENTS, PACKAGING CPMD





THERMINIC 2007

Electronic Workshop Registration form http://tima.imag.fr/conferences/therminic/



INTERNATIONAL WORKSHOP ON THERMAL INVESTIGATIONS OF ICS AND SYSTEMS

Sponsored by the IEEE Components, Packaging, and Manufacturing Technology Society and by CMP

AIM OF THE WORKSHOP

Registration will be electronically only

Detailed information about the registration process is available on the THERMINIC Web page. Authors should in addition notify their registration to the General Chair Bernard COURTOIS by email **(THERMINIC@imag.fr)**. **Workshop advance registration is applied if participant is registered and the payment is received before 24 August 2007**.

Please tick the appropriate:

IEEE Member: IEEE N°	Advance Until 24 August 2007	Late After 24 August 2007	Sub-total
Author: Paper N° Session N° Committee Member	480 Euros	580 Euros	
Non-member	580 Euros	690 Euros	
☐ Additional ticket (65 €/each) Cocktail and social event	65 Euros	65 Euros	
☐ Additional Proceedings (35 €/each)	35 Euros	35 Euros	
		TOTAL	€

• Workshop registration fee covers admission to all sessions, coffee breaks, lunches on 17-18-19 September 2007, the social event and the Workshop proceedings.

• For payment by credit card (ADR), follow the registration instruction, you will find it in the payment part. Return the form to:



Bernard Courtois

46 Avenue Félix Viallet 38000 Grenoble, France Fax: +33 4 76 47 38 14

■ Refund policy for preregistration: there is a 80 Euros service charge for processing refunds. Requests for preregistration refunds must be received no later than 6 working days prior to the first day of the Workshop to be honoured. **No refunds will be issued after 06 September 2007.** Substitutions will be accepted at any stage.

THERMINIC Workshops are a series of events to discuss the essential thermal questions of microelectronic microstructures and electronic parts in general. These questions are becoming more and more crucial with the increasing element density of circuits packaged together and with the move to nanotechnology. These trends are calling for thermal simulation, monitoring and cooling. Thermal management is expected to become an increasingly dominating factor of a system's cost. The growing power dissipated in a package, the mobile parts of microsystems raise new thermal problems to be solved in the near future necessitating the regular discussion of the experts in these fields. Finally, there is an increasing need for accurate assessment of the boundary conditions used in the analysis of electronic parts, which requires a concurrent solution of the thermal behaviour of the whole system.

AREAS OF INTEREST

The main topics to be discussed during the Workshop are the following:

Education

data

Temperature Mapping

Techniques

Novel and Advanced Cooling

Heat Transfer Enhancement

Validation of Thermal Software

Coupled (Thermo-mechanical,

Thermo-optical, etc.) Effects

Thermal Stress Failures: Prediction

Nanotechnology Applications.

Thermal Stress: Theory and Experiment

and Prevention

Measurement of Thermal Properties

Acquisition and analysis of Thermal

Thermal Performance of Interconnects

- Thermal and Temperature Sensors
- Thermal Simulation
- Electro-thermal Simulation
- Thermal Modelling and
- Investigation of Packages
- ➡ Reliability Issues
- High Temperature Electronics
- Heat Transfer Education
- Flow Visualisation Techniques
- Turbulence Modelling in Complex Geometrics
- Defect and failure modelling
- Reliability evolution and prediction
- Multiphysics simulation
- Nanoengineering issues
 - noengineering issues



Previous THERMINIC Workshops have been held in Grenoble (1995), Budapest (1996), Cannes (1997 and 1998), Rome (1999), Budapest (2000), Paris (2001), Madrid (2002), Aix en Provence (2003), Sophia Antipolis Côte d'Azur (2004) and Belgirate (2005) and Nice (2006).



The programme includes 3 invited talks by prominent speakers (see the paragraph below), 33 oral in 8 sessions, oral contributions consist of 15 min. presentations followed by 5 min. discussion, 12 poster presentations, all posters will be introduced by one slide in 3 minutes each in a plenary session.

VENUE

Budapest - one of the most beautiful cities in the world - has developed where it is, is not down to some historical accident. Take a look at Gellért Hill, right next to the River Danube as it flows majestically through the centre of the modern city. It was precisely the combination of the relative ease of crossing the River here and the natural protection the hill offered against invasion that decided the earliest settlers it was the ideal place to build a town. The Eravisci, a tribe of highly cultured Celts, had already settled at Gellért Hill in the third and fourth centuries B.C. They worked with iron, decorated their earthenware pots and even minted their own coins. Later, the Romans built a settlement at today's Óbuda. They called it Aquincum and it was an important station along the limes which ran alongside the River Danube.



LOCATION

The Workshop will take place in the Danubius Gellért Hotel.

Danubius Hotel Gellert is one of the most traditional hotels in Budapest and Hungary.

The hotel was erected on the right bank of the River Danube between 1916 and 1918 until its opening to the public on September 24th, 1918 and has maintained the highest recognition ever since. Next to the hotel you can find the world famous Gellert Bath. Danubius Hotel Gellert Budapest is located in a picturesque environment at the foot of Gellert Hill, on the bank of the Danube, is ideally situated for both business and leisure travellers. This impressive location is within walking distance to Budapest's most fashionable shopping and business district with one of the most beautiful sights of Budapest, the Liberty Bridge.

> DANUBIUS HOTEL GELLERT Szent Gellért tér, 1Budapest H-1111, Hungary Phone: +36 1 8895500 - Fax: +36 1 8895505 http://www.danubiushotels.com/gellert



SOCIAL EVENT ON 18 SEPTEMBER 2007

The Danube is celebrated as Europe's greatest river. It is a river of great beauty and importance flowing through central and southeastern Europe, as well as, the Balkans and the Black Sea. It has been the inspiration of music, novels and poems. Nine countries share its waters, including Germany, Austria, Slovakia, Hungary, Yugoslavia, Serbia, Bulgaria, Croatia, Romania, and Hungary. Danube at Budapest it is dominating the city, separating it to Buda and Pest.

Our cruise will start in the evening, showing some of the most important monuments of Budapest, like the Hungarian Academy of Sciences, The House of Parliament, the beautiful bridges, the major universities, the National Theater, the new Concert Hall, the traditional old hotels, etc. As the sun goes down the city changes gradually and become s truly captivating with the sophisticated illumination of the buildings that the cruisers can enjoy besides a nice diner and good wines.

WORKSHOP COMMITTEE

General Chair	> B. Courtois, CMP, Grenoble, France
Vice General Chair	> M. Rencz, BUTE, Budapest, Hungary
Programme Chairs	> C. Lasance, Philips, Eindhoven, The Netherlands
	> V. Székely, BUTE, Budapest, Hungary

PROGRAMME COMMITTEE

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G. De Mey, Ghent Univ., Belgium	R. E
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вара,	Nat. Metrology Institute
	Tsukuba, Japan
·N. Sabry,	Univ. Française
	d'Égypte/Egypt
Pape,	Infineon Techn./Germany

SPECIAL ISSUES AND SPECIAL SECTIONS

of leading periodicals have been organised regarding the previous Workshops (Journal of Sensors and Actuators, Microelectronics Journal, IEEE Transactions on VLSI Systems, IEEE Transactions on Components and Packaging Technologies, Journal of Electronic Packaging). It is again expected to have special issues and special sections of leading periodicals as follow up of the Workshop 2007.

INFORMATION

More information on the Workshop is available from: Bernard COURTOIS Marta RENCZ

CMP

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Budapest University of Technology and Economics



XHIBITION



An exhibition will be held during the time of the Workshop. Tabletops or Spaces for a portable marketing stand 6sgm are available to companies interested to exhibit equipment, materials, software, etc. Booking of each table-top or Spaces for a portable marketing stand 6sqm will give one slot of time during the vendors'

session. The number of spaces is limited. They will be offered on a first signed - first served basis. Contact the General Chair for more information.



HOTEL INFORMATION

Hotel Gellért Budapest has offered a package deal for THERMINIC 2007. Please book early, the allocation

and special rates are subject to availability. Delegates must arrange their accommodation directly with Hotel Gellért Budapest. Reservation deadline: 24 August 2007.



For hotel details please visit the following web page: http://www.danubiushotels.com/gellert

PROCEEDINGS

of this Workshop will be available at the meeting as part of the registration fee. If you cannot attend, you may still order Proceedings at the price of 35€ (order form available on

the conference web site, the sending of the Proceedings package will be done after the Workshop, and if the payment is received).

THERMINIC is happy to acknowledge the services of SuviSoft Oy Ltd for the technical management of the Workshop.

SPECIFIC EVENTS SPONSORING

If you wish to sponsor an event like a reception, a lunch, or any specific event during the Workshop, please contact the General Chair.

POSTERS

All posters will be introduced by one slide in 3 minutes each. They will be presented in one session on 18 September from 16:50 to 17:29. They will be mounted during the registration.

Authors are expected to be at their posters during the posters viewing session just after the introduction session on 18 September. The posters will be removed by the end of the Workshop.

THERMAL CHALLENGES IN 3-D STACKED PACKAGING

Venkat Natarajan, Intel India Pvt. Ltd., Bangalore, India

Emerging Trends in electronics industry has led to the rapid development of 3-D stacked packaging technology. 3-D packages offer compactness in form factors with significant benefits in performance. The present talk will define key thermal challenges in enabling 3-D stacked packaging technology. Both component-level and system-level challenges will be discussed for the computing platform. Potential research opportunities/directions in the field of heat transfer for 3-D technologies will be presented. Results from on-going heat transfer research on 3-D stacks (P-O-P) at Intel will be presented.

HIGH PERFORMANCE THERMAL INTERFACE **TECHNOLOGY OVERVIEW**

Bruno Michel, IBM Zurich Research Laboratory, Rueschlikon, Switzerland

An overview on recent developments of thermal interfaces will be given with a focus on a novel thermal interface technology that allows formation of 2-3 times thinner bondlines with much better thermal properties at lower assembly pressures. This is achieved using a nested hierarchical surface channels to control of particle stacking with highly particle-filled materials. Thermal cycling demonstrates a decrease in thermal resistance over time and longer overall lifetimes.

THERMAL MANAGEMENT AND THERMAL **RESISTANCE OF HIGH POWER LEDs**

Thomas Zahner, OSRAM Opto Semiconductors, Regensburg, Germany

The junction temperature of Light Emitting Diodes (LEDs) is a primary reliability parameter. Exceeding the maximum rated junction temperature could lead to accelerated light output degradation and sometimes even to catastrophic failures. Besides that junction temperature influences the desired LED properties in applications like light output efficiency, dominant wavelength and forward voltage. Therefore thermal management and proper thermal characterisation of high power LEDs is very important for a reliable product with good performance. By measuring the thermal resistance of a high power LED it has to take into account that the power applied to the device is converted into heat and light (~20-40% efficiency). This means that the thermal resistance of a LED can not be determined without knowing the energy flux emitted as light. Therefore in general the interpretation of a given thermal resistance of an optoelectronic device is not well defined. Establishing of a standard on how to do thermal resistance measurement for light emitting devices is necessary.

PROGRAMME SEPTEMBER 200

08:00	- 09:00	Registration			
08:50	- 09:00	Welcome address			
	Bernard Courtois, CMP, Grenoble, France				
	Márta Rencz	, Budapest Univ. of Technology and Economics (BUTE).			
	Hungary	,, (,,			
09:00	- 09:40	Invited talk I: THERMAL CHALLENGES			
	IN 3-D STA	CKED PACKAGING			
	Venkat Nata	rajan, Intel India, Bangalore, India			
	Chair: Cleme	ens Lasance, Philips Research Laboratories, Eindhoven,			
	The Netherlan	ds			
09:40	- 11:00	Session I: TRANSIENT THERMAL			
	CHARACTE	RISATION			
	Chair: TBA				
09:40	APPLICATIO	ON OF STRUCTURE FUNCTIONS FOR			
	THE INVEST	FIGATION OF FORCED AIR COOLING			
	Marcin Janio	ki, Marek Kaminski, Andrzej Napieralski, Technical			
	Univ. of Lodz,	Poland			
	Jedrzej Bana	szczyk, Gilbert De Mey, Bjorn Vermeersch,			
	Ghent Univ., B	elgium			
10:00	UTILITY OF	TRANSIENT THERMAL TESTING			
	TO CHARA	CTERIZE THERMAL INTERFACE MATERIALS			
	Brian Smith,	Thomas Brunschwiler, Hugo Rothuizen, Bruno			
	Michel, IBM	Research, Switzerlan			
10:20	SHORT TIN	E DIE ATTACH CHARACTERISATION			
	OF SEMICO	NDUCTOR DEVICES			
	Peter Szabo,	Márta Rencz, Budapest Univ. of Technology			
	and Economics	s, Hungary			
10:40	METHOD O	F IMAGES FOR THE FAST CALCULATION OF			
	TEMPERAL	URE DISTRIBUTIONS IN PACKAGED VLSI CHIPS			
	Virginia Mai	tin Heriz, Je-Hyoung Park, Travis Kemper, Sung-Mo			
11.00	Kang, All Sh				
	- 11:20	COFFEE DREAN			
11:20 -	Chairy TRA	Session 2: RELIABILITY OF SOLDER JOINTS			
11.20					
11.20		RGA PACKAGE BY CONSIDERING			
	THE INTER	ACTION RETWEEN DESIGN FACTORS			
	Satoshi Kon	do Ojang Yu Tadahiro Shibutani Masaki Shiratori			
	Yokohama Nat	ional Univ., Japan			
11:40	EVALUATIO	N TECHNIQUE FOR THE FAILURE LIFE SCATTER			
	OF LEAD-F	REE SOLDER JOINTS IN ELECTRONIC DEVICE			
	Hiroki Miva	ichi, Qiang Yu, Tadahiro Shibutani, Masaki Shiratori,			
	Yokohama Nat	ional Univ., Japan			
12:00	EVALUATIO	N OF THE IMPACT OF SOLDER DIE ATTACH			
	VERSUS EP	OXY DIE ATTACH IN A STATE OF THE ART			
	POWER PA	CKAGE			
	Julia Czerno	horsky, Bartosz Maj, Matthias Viering, Continental			
	Automotive Sy	stems, Germany			
	Lance Wrigh	t, Gerry Balanon, Texas Instruments, USA			
12:20	THE CHARA	CTERISTICS OF ELECTROMIGRATION			
	AND THER	MOMIGRATION IN FLIP CHIP SOLDER JOINTS			
	Dan Yang, Y.	C. Chan, Department of Electronic Engineering, City Univ.			
	of Hong Kong,	Hong Kong			
12:40	- 14:00	LUNCH			

PROGRAMME SEPTEMBER 2007

14:00	- 15:50	Session 3: MICROSCALE COOLING
	Chair: TBA	
14:00	DEVELOPI	VIENT OF EHD ION-DRAG MICROPUMP
	FOR MICR	OSCALE ELECTRONICS COOLING SYSTEMS
	Anthony Re	obinson. Trinity College Dublin, Ireland
14.30	NUMERIC	ALLY INVESTIGATING THE FEFECTS OF CROSS
14.50		
	Minh N Do	ng Ibrohim C Hosson Sung In Kim Concerdia Univ
	IVIIIII N Da	ng, ibianini d nassan, sung in kini, concordia univ.,
14.50		
14:50	COPPER-F	
	HEAT SIN	<u>CIECNOLOGY</u>
	Filimon Zao	haratos, Androula Nassiopoulou, IMEL, NCSR
	"Demokritos"	, Greece
15:10	DEPENDE	NCY OF HEAT TRANSFER RATE
	ON THE B	RINKMAN NUMBER IN MICROCHANNELS
	Heesung Pa	ark, Stoke's Institute, Univ. of Limerick, Ireland
15:30	A NOVEL	VLSI TECHNOLOGY TO MANUFACTURE
	HIGH-DEN	ISITY THERMOELECTRIC COOLING DEVICES
	Howard Ch	en, Louis Hsu, Xiaojin Wei, IBM, USA
		· · · · ·
15:50	- 16:10	COFFEE BREAK
16:10 ·	- 16:50	Vendor session
	Chair: Bern	ard Courtois, CMP, Grenoble, France
16:50	- 17:30	Poster session: introduction and viewing
	Chair: Már	ta Rencz, Budapest Univ. of Technology and Economics,
	Hungary	
The oost	ters will be i	ntroduced by one slide in maximum 3 minutes each.
16:50	DEVELOP	MENT OF THE MICRO CAPILLARY PUMPED
	LOOP FOR	
	Sook-Hwar	Moon Electronic Telecommunication Persoarch Institute
	South Koroa	Noon, Electronic releconstitution research institute,
16.52		
10.55		
	Jianzneng	nu, Lianqiao Yang, woo wnan Snin, Myongji Univ., South
10.50	Korea	
10:50	VERY FAS	I CHIP-LEVEL IMERIVIAL ANALYSIS
	Keiji Nakat	ayashi, Nara Institute of Science and Technology, Japan
	Tamiyo Nal	kabayashi, Nara Women's Univ., Japan
	Kazuo Nak	ajima, Univ. of Maryland, USA
16:59	INVESTIG	ATION OF MICRO POROSITY SINTERED WICK
	IN VAPOR	CHAMBER FOR FAN LESS DESIGN
	Chun Shen	g Yu, Tamkang Univ., Taiwan
17:02	STUDY OF	WATER SPEED SENSITIVITY IN
	A MULTIF	UNCTIONAL THICK-FILM SENSOR BY
	ANALYTIC	AL THERMAL SIMULATIONS AND EXPERIMENTS
	Fabio Stefa	ni, Paolo Emilio Bagnoli, Univ. of Pisa, Italy
	Stefano Lu	schi, AMIC srl. Italy
17:05	ADVANCE	MENT OF MULTIFUNCTIONAL SUPPORT
	STRUCTU	RE TECHNOLOGIES (AMESST)
	Ralf John	
	Carbina At	NASMET Tornalia Spain
	Garbine At	raya, INASMET-Techalla, Spain
	Hap Jens H	rerker, UHB-Systems AG, Germany
	Altred New	Veria, ESA/ESTEC, Netherlands

PROGRAMME SEPTEMBER 2007

17:08	NON-DESTRUCTIVE FAILURE ANALYSIS AND MODELLING
	OF ENCAPSULATED MINIATURE SMD CERAMIC CHIP
	CAPACITORS USING THERMAL AND MECHANICAL LOADING
	Bernhard Wunderle, Daniel May, Tanja Braun, Hans Walter,
	Karl-Friedrich Becker, Bernd Michel, Fraunhofer IZM, Germany
	Herbert Reichl, Techische Universität Berlin, Germany
17:11	TRANSIENT NON-LINEAR THERMAL FEM SIMULATIONS
	OF SMART
	Vladimir Kosel, KAI GmbH, Austria
17:14	COMBINATION OF THERMAL SUBSYSTEMS MODELLED
	BY RAPID CIRCUIT TRANSFORMATION
	York Christian Gerstenmaier, Siemens AG, Corporate Technology,
	Germany
	Gerhard Wachutka, Munich Univ. of Technology, Germany
<u>17:17</u>	A NOVEL THERMAL POSITION SENSOR INTEGRATED
	ON A PLASTIC SUBSTRATE
	Anastasios Petropoulos, NCSR "Demokritos", Greece
	Grigoris Kaltsas, TEI Athens, Greece
	Androula Nassiopoulou, NCSR "Demokritos", Greece
17:20	INFLUENCE OF TRANSPARENT SURFACE LAYER
	ON EFFECTIVE THERMOREFLECTANCE COEFFICIENT
	OF TYPICAL STACKED ELECTRONIC STRUCTURES
	Pavel Komarov, Mihai Burzo, Peter Raad, SMU, USA
17:23	DYNAMIC THERMOELECTRIC DEVICE SPICE MODEL
	FOR TRANSIENT COOLING ANALYSIS
	Daniel Mitrani, Jordi Salazar, Antoni Turó, Miguel J. García,
	Juan A. Chávez, Catalonia Technical Univ., Spain

I8:30 COCKTAIL

Notes



A VANAT
DED /UUT
DENZE

<u> </u>	
08:30	- 09:10 Invited talk 2: HIGH PERFORMANCE
	THERMAL INTERFACE TECHNOLOGY OVERVIEW
	Bruno Michel, IBM Zurich Research Laboratory, Rueschlikon, Switzerland
	Chair: Vladimír Székely, Budapest Univ. of Technology and Economics,
00.10	Hungary
09:10	- IU:30 SESSION 4: PROGRESS IN COMPACE
	Chair: TPA
09.10	
05.10	TRANSPORT EQUATION: PART I - FUNDAMENTALS
	Lorenzo Codecasa. Politecnico di Milano. Italy
09:30	THERMAL NETWORKS FROM PHONON BOLTZMANN'S
	TRANSPORT EQUATION: PART II - COMPACT MODELING
	Lorenzo Codecasa, Politecnico di Milano, Italy
09:50	FLEXIBLE PROFILE APPROACH TO THE CONJUGATE HEAT
	TRANSFER PROBLEM
	Mohamed-Nabil SABRY, Universite Francaise d'EGYPTE, Egypt
10:10	A NEW METHODOLOGY FOR EXTRACTION OF DYNAMIC
	COMPACT THERIVIAL MODELS
	Wassim Habra, Patrick Jounsi, Francesc Madrid, LAAS, France
	Philippe Dupuy, Freescale Semiconductor, France
	Jean-Marie Dorker, LAAS, Flance
10:30	- IO:50 COFFEE BREAK
10:30 10:50	- IO:50 COFFEE BREAK - I2:30 Session 5: ADVANCES IN COOLING
10:30 10:50	- IO:50 COFFEE BREAK - I2:30 Session 5: ADVANCES IN COOLING TECHNOLOGIES
10:30 10:50	- 10:50 COFFEE BREAK - 12:30 Session 5: ADVANCES IN COOLING TECHNOLOGIES Chair: TBA
10:30 10:50 10:50	- 10:50 COFFEE BREAK - 12:30 Session 5: ADVANCES IN COOLING TECHNOLOGIES Chair: TBA ACOUSTICALLY ENHANCED BOILING HEAT TRANSFER
10:30 10:50 10:50	- 10:50 COFFEE BREAK - 12:30 Session 5: ADVANCES IN COOLING TECHNOLOGIES Chair: TBA ACOUSTICALLY ENHANCED BOILING HEAT TRANSFER Ari Glezer, Zach Douglas, Marc Smith, Georgia Tech, USA
10:30 10:50 10:50 11:10	- 10:50 COFFEE BREAK - 12:30 Session 5: ADVANCES IN COOLING TECHNOLOGIES Chair: TBA ACOUSTICALLY ENHANCED BOILING HEAT TRANSFER Ari Glezer, Zach Douglas, Marc Smith, Georgia Tech, USA CONTROLLED POOL-BOILING SYSTEMS: A WAY FOR UNDER STREEMED FOR COMPANY
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Vivek Khaire, Avijit Goswami, Applied Thermal Technologies India, India

12:30 - 14:00 LUNCH



PROGRAMME SEPTEMBER 2007

PROGRAMME 19 SEPTEMBER 2007

14:00 - 15:40 Session 6: DEVELOPMENTS	09:00 - 09:40 Invited talk 3: THERMAL MANAGEMENT
IN EXPERIMENTAL ANALYSIS	AND THERMAL RESISTANCE OF HIGH POWER LEDS
Chair: TBA	Thomas Zahner, OSRAM Opto Semiconductors, Regensburg, Germany
14:00 INVESTIGATION OF THERMAL PROCESSES IN HIGH	Chair: Márta Rencz, Budapest Univ. of Technology and Economics,
POWER LASER BARS BY THERMOREFLECTANCE	Hungary
SPECTROSCOPY	09:40 - 10:40 Session 7: MULTI-PHYSICS SIMULATION
Dorota Pierscinska, Kamil Pierscinski, Anna Kozlowska, Maciej	Chair: TBA
Bugajski, Institute of Electron Technology, Poland	09:40 DYNAMIC ELECTROTHERMAL SIMULATION
Jens W. Tomm, Max Born Institute, Germany	OF INTEGRATED RESISTORS AT DEVICE LEVEL
14:20 JOULE EXPANSION IMAGING TECHNIQUES	Bjorn Vermeersch, Gilbert De Mey, Ghent Univ., Belgium
ON A MICROLECTRONIC DEVICE	10:00 LUMPED AND DISTRIBUTED PARAMETER SPICE MODELS
Stéphane Grauby, Univ. Bordeaux1, CPMOH, France	OF TE DEVICES CONSIDERING TEMPERATURE
Luis Patino Lopez, Amine Salhi, Jean-Michel Ramphoux, Wilfrid	DEPENDENT MATERIAL PROPERTIES
Claeys, Stefan Dilhaire, CPMOH, France	Daniel Mitrani, Jordi Salazar, Antoni Turo, Miguel Jesus Garcia,
14:40 IIVIPROVEIVIENTS OF THE VARIABLE THERIVAL RESISTANCE	
Viadimir Szekely, Sandor Torok, Ern Kollar, Budapest Univ.	
	A H Koovoots H I Equip Religion Applied Technologies Notherlands
Poter Furies Istvan Bársony Cs Dücs Research Inst for Technical	A.n. Koevoets, n.j. Lygink, rinnps Applied lectinologies, Nethenalids
Physics and Materials Science - MEA Budanest Hungary	IO:40 - II:00 COFFEE BREAK
P Csíkvári Budanest Univ of Technology and Economics Hungary	II:00 - I2:00 Session 8: PACKAGE RELIABILITY
15:20 A MODULAR HIGH-TEMPERATURE MEASUREMENT SET-UP	Chair: TBA
FOR SEMICONDUCTOR DEVICE CHARACTERIZATION	11:00 INVERSE DAMAGE DETECTION IN IC PACKAGING
Peter Borthen, Gerhard Wachutka, Munich Univ. of Technology,	COMPONENT
Germany	Wen-Chang Lin, Chun-Yin Wu, Tatung Univ., Taiwan
	11:20 VIBRATION COMBINED HIGH TEMPERATURE CYCLE TESTS
I5:40 - I6:00 COFFEE BREAK	FOR CAPACITIVE MEMS ACCELEROMETERS
16:00 - 17:30 Panel: THERMALLY INDUCED STRESSES	Zoltan Szucs, Gergely Nagy, Sandor Hodossy, Andras Poppe,

5:00 - 17:30 Panel: THERMALLY INDUCED STRESSES AND STRAINS IN ELECTRONIC INDUSTRY

Moderator: Mohamed-Nabil Sabry, French Univ. Center for R&D and Int'l Coop., Egypt

Panellists:

Bart Vandevelde, IMEC, Leuven, Belgium

Peter Rodgers, The Petroleum Inst., UAE

Richard van Silfhout, Philips, Center for Industrial Tech., Eindhoven, The Netherlands

Chris Bailey, Univ. of Greenwich, London, UK

I9:00 - 22:00 SOCIAL EVENT: CRUISE ON THE DANUBE.

Notes



Márta Rencz, Budapest Univ. of Technology and Economics, Hungary 11:40 REDUCING AVERAGE AND PEAK TEMPERATURES OF VLSI

CMOS DIGITAL CIRCUITS BY MEANS OF HEURISTIC

Wladyslaw Szczesniak, Gdansk Univ. of Technology, Poland

SCHEDULING ALGORITHM

LUNCH

12:00 - 13:30

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BY AIR

Budapest is very conveniently reachable by air. All the major European airlines have several flights a day to Budapest Airport that is an about 30 min drive from the Hotel Gellert. MALEV Hungarian Airlines is member of the one world alliance offering services all around the world. More information at:

http://www.budapestinfo.hu/en/general_information/getting_here

Notes







ACCOMMODATION BOOKING FORM

Ref: THERMINIC Workshop, 17-19 September 2007

Hotel Gellért Budapest has offered a package deal for THERMINIC 2007. Please book early, the allocation and special rates are subject to availability. Delegates must arrange their accommodation directly with

Hotel Gellért Budapest

Reservation deadline: 24 August 2007

For hotel details please visit the following web page: danubiushotels.com/gellert

Type A: Single room with bath (courtyard view) EUR 104/room/night, breakfast, VAT and access to the thermal baths on site included

Type B: Double room (courtyard view) EUR 136/room/night, breakfast, VAT and access to the thermal baths on site included

Guest details			Please complete one form per room		
First name of Delegate(s):					
Last name:					
Organization:					
Address (street, post code, city	/, countr	y):			
Tel. No: Fax. No.:					
E-mail:					
Arrival Date:	Departure Date:			No. of Nights:	
Room type (A, B):	Number of adults in th		room:		
Credit Card:					
Number:					
Exp. Date:	Card verification value: (please type the 3 last numbers that are on the back of your card)				
Card Holders Name:					
Signature					

Booking / payment information

- 1. Cancellation deadline for the reservation is 3 days prior to arrival
- 2. In case of no-show or late cancellation your credit card will be charged with 1 night cost.
- 3. Check-in time: from 2 PM, check-out: until 12 AM (noon)
- 4. We cannot guarantee hotel accommodation will be available for request made after 24 August 2007.

Confirmation from Hotel Gellért (please leave blank)

Mail/fax this form as soon as possible to HOTEL GELLÉRT BUDAPEST at: **HOTEL GELLÉRT BUDAPEST**

H-1111 Budapest, Szent Gellért tér 1, Hungary Telephone: +36 1 889-5500 - Fax: +36 1 889-5505 Email: gellert.reservation@danubiusgroup.com

