

**2014 15th International Conference
on Thermal, Mechanical and
Multi-Physics Simulation and Experiments
in Microelectronics and Microsystems**

(EuroSimE 2014)

**Ghent, Belgium
7-9 April 2014**



**IEEE Catalog Number: CFP14566-POD
ISBN: 978-1-4799-4789-8**

TABLE OF CONTENTS

Applications Of Laser Welding To Electric Connectors	1
<i>C. Liao, S. Liu, K. Liao</i>	
Thermo-Electrical And Structural Coupled Simulations Of Buckling Beam Microprobes In High Temperature/High Current Conditions.....	7
<i>D. Eckhaut, E. Bertarelli, D. Acconcia, R. Vallauri, G. Cocchetti, A. Corigliano</i>	
Limitations And Accuracy Of Steady State Technique For Thermal Characterization Of Solid And Composite Materials.....	11
<i>M. AboRas, B. Wunderle, D. May, R. Schacht, T. Winkler, S. Rzepka, B. Michel</i>	
A Product Based Lap Shear Fatigue Testing Of Electrically Conductive Adhesives.....	18
<i>B. Ozturk, A. Youssef, P. Gromala, C. Silber, K. Jansen, L. Ernst</i>	
Process And Reliability Of SF₆/O₂ Plasma Etched Copper TSVs.....	23
<i>L. Filipovic, R. Orio, S. Selberherr</i>	
Characterization And Post Simulation Of Thin-Film PZT Actuated Plates For Haptic Applications.....	27
<i>F. Casset, J. Danel, P. Renaux, C. Chappaz, G. Le Rhun, C. Dieppedale, M. Gorisse, S. Basrour, S. Fanget, P. Ancey, A. Devos, E. Defay</i>	
Using Molecular Modeling To Uncover The Origins Of Subtle Solvation-Based Film Defects.	31
<i>N. Iwamoto, T. Baldwin</i>	
Description Of The Thermo-Mechanical Properties Of A Sn-Based Solder Alloy By A Unified Viscoplastic Material Model For Finite Element Calculations	32
<i>A. Kabakchiev, B. Metais, R. Ratchev, M. Guyenot, P. Buhl, M. Hossfeld, X. Schuler, R. Metasch, M. Roellig</i>	
Failure Mechanisms In Chip-Metallization In Power Applications	38
<i>C. Durand, M. Klingler, D. Coutellier, H. Naceur</i>	
Thermo-Mechanical Stress Investigation Of Integrated SAW Strain Sensors.....	43
<i>J. Hempel, S. Anees, J. Wilde, L. Reindl</i>	
Software Reliability And Its Interaction With Hardware Reliability	47
<i>W. Driel, M. Schuld, R. Wijgers, W. Kooten</i>	
Electromigration Reliability Of Cylindrical Cu Pillar SnAg_{3.0}Cu_{0.5} Bumps.....	55
<i>L. Meinshausen, K. Weide-Zaage, B. Goldbeck, A. Moujbani, J. Kludt, H. Fremont</i>	
Reliability Assessment Of Discrete Passive Components Embedded Into PCB Core.....	61
<i>R. Schwerz, M. Roellig, S. Osmolovskiy, K. Wolter</i>	
Development And Validation Of Dye-Sensitized Solar Cell Finite Element Model For Sealing Failure Investigation.....	68
<i>C. Han, S. Park</i>	
Measuring Young's Modulus Of Polysilicon Via Cantilever Microbeam Arrays	73
<i>S. Kehrberg, M. Dorwarth, S. Gunther, S. Markisch, C. Geckeler, J. Mehner</i>	
Degradation Of Silicone In White LEDs During Device Operation: A Finite Element Approach To Product Reliability Prediction	77
<i>S. Watzke, P. Altieri-Weimar</i>	
Creep And Fatigue As Main Degradation Phenomena In Reliability Of Solder Joints.....	82
<i>K. Jankowski, A. Wymyslowski</i>	
Investigation Of Temperature And Moisture Effect On Interface Toughness Of EMC And Copper Using Cohesive Zone Modeling Method	87
<i>X. Ma, G. Zhang</i>	
Comparison Of Thermal And Hygro Effects On The Degradation Of LED Package	92
<i>X. Ma, G. Zhang</i>	
A Lifetime Prediction Method For Solid State Lighting Power Converters Based On SPICE Models And Finite Element Thermal Simulations	96
<i>B. Sun, X. Fan, L. Zhao, C. Yuan, S. Koh, G. Zhang</i>	
Understanding Delamination For Fast Development Of Reliable Packages For Automotive Applications. A Consideration Of Robustness For New Packages Based On Simulation.....	100
<i>R. Pufall, M. Goroll, G. Reuther</i>	
Evaluation Of The Residual Stress Distribution In Thin Films By Means Of The Ion Beam Layer Removal Method.....	106
<i>D. Kozic, R. Trembl, R. Schongrundner, R. Brunner, D. Kiener, T. Antretter, H. Ganser</i>	
Thermo-Mechanical Analyses Of Printed Board Assembly During Reflow Process For Warpage Prediction	111
<i>S. Chung, S. Oh, T. Lee, M. Park</i>	

Design Independent Lifetime Assessment Method For PCBs Under Low Cycle Fatigue Loading Conditions	116
<i>P. Fuchs, G. Pinter, T. Krivec</i>	
Determination Of Cyclic Mechanical Properties Of Thin Copper Layers For PCB Applications	121
<i>K. Fellner, P. Fuchs, T. Antretter, G. Pinter, R. Schongrundner</i>	
Drop Impact Simulations For Lifetime Assessment Of PCB/BGA Assemblies Regarding Pad Cratering	128
<i>G. Simo, H. Shirangi, M. Nowotnick, R. Dudek, E. Kaulfersch, S. Rzepka, B. Michel</i>	
Predictive Reliability Using FEA Simulations Of Power Stacked Ceramic Capacitors For Aeronautical Applications.....	138
<i>W. Benhadjala, B. Levrier, I. Bord-Majek, L. Bechou, E. Suhir, Y. Ousten</i>	
An Investigation Of The Tensile Deformation And Failure Of An Epoxy/Cu Interface Using Coarse-Grained Molecular Dynamics Simulations.....	144
<i>S. Yang, J. Qu</i>	
Methodology For Supporting Electronic System Prototyping Through Semiautomatic Component Selection.....	152
<i>R. Swierczynski, K. Urbanski, A. Wymyslowski</i>	
An Accelerated Method For Characterization Of Bi-Material Interfaces In Microelectronic Packages Under Cyclic Loading Conditions	156
<i>E. Poshtan, S. Rzepka, B. Michel, C. Silber, B. Wunderle</i>	
Simulation Of Stress Distribution In Assembled Silicon Dies And Deflection Of Printed Circuit Boards.....	163
<i>K. Macurova, P. Angerer, R. Schongrundner, T. Krivec, M. Morianz, T. Antretter, R. Bermejo, M. Pletz, M. Brizoux, W. Maia</i>	
Acquisition Unit For In-Situ Stress Measurements In Smart Electronic Systems	170
<i>A. Palczynska, F. Pesth, P. Gromala, T. Melz, D. Mayer</i>	
Modelling Of Non-Stationary Processes In Optomechanical Thermal Microsensors.....	174
<i>A. Kozlov</i>	
Multiphysics Modeling For Current Carrying Capability Of A Power Package.....	181
<i>Q. Qian, Y. Liu, Y. Liu</i>	
Comparison Of Bondwire Life With Effective Strain Method And Cohesive Zone Method For A Power Package.....	187
<i>J. Zhang, Y. Xu, Y. Liu</i>	
Adhesion Work Analysis By Molecular Modelling And Wetting Angle Measurement.....	194
<i>K. Allaf, D. Krol, A. Wymyslowski, I. Zubel, K. Rola</i>	
Modeling And Simulation Of A MEMS Thermal Actuator With Polysilicon Heater.....	199
<i>D. Dellaert, J. Doutreloigne</i>	
Thermo-Mechanical Stress Of Underfilled 3D IC Packaging.....	205
<i>M. Wang, M. Wu</i>	
Investigation Of Color Shift Of LEDs-Based Lighting Products.....	210
<i>S. Koh, H. Ye, M. Mehr, J. Wei, W. Driel, L. Zhao, G. Zhang</i>	
Crosstalk Phenomena Analysis Using Electromagnetic Wave Propagation By Experimental And Numerical Simulation Methods	215
<i>A. Palczynska, A. Wymyslowski, T. Bieniek, G. Janczyk, D. Pasquet, T. Dinh</i>	
Size Effect On The Microbridges Quality Factor Tested In Free Air Space	225
<i>M. Pustan, C. Birleanu, F. Rusu, C. Dutescu, O. Belcin</i>	
FEM Simulations For Built-In Reliability Of Innovative Liquid Crystal Polymer-Based QFN Packaging And Sn96.5Ah3Cu0.5 Solder Joint	231
<i>W. Chenniki, I. Bord-Majek, B. Levrier, K. Wongtimnoi, J. Diot, Y. Ousten</i>	
Framework To Extract Cohesive Zone Parameters Using Double Cantilever Beam And Four-Point Bend Fracture Tests	235
<i>S. Raghavan, I. Schmadlak, G. Leal, S. Sitaraman</i>	
Measuring The Mechanical Relevant Shrinkage During In-Mold And Post-Mold Cure With The Stress Chip	240
<i>F. Schindler-Saefkow, F. Rost, A. Rezaie-Adli, K. Jansen, B. Wunderle, J. Keller, S. Rzepka, B. Michel</i>	
CMOS Stress Sensor For 3D Integrated Circuits: Thermo-Mechanical Effects Of Through Silicon Via (TSV) On Surrounding Silicon	245
<i>K. Ewuame, V. Fiori, K. Inal, P. Bouchard, S. Gallois-Garreignot, S. Lioni, C. Tavernier, H. Jaouen</i>	
Structure Design And Reliability Assessment Of Double-Sided With Double-Chip Stacking Packaging.....	253
<i>Y. Su, C. Lin, T. Kuo, K. Chiang</i>	
2D Micro-Chamber For DC Plasma Working At Low Power.....	257
<i>V. Rochus, V. Samara, B. Vereecke, P. Soussan, B. Onsia, X. Rottenberg</i>	

The Shear Strength Of Nano-Ag Solders And The Use Of Ag Interconnects In The Design And Manufacture Of SiGe-Based Thermo-Electric Modules	263
<i>M. Edwards, K. Brinkfeldt, M. Silva, D. Andersson</i>	
Analysis Of RF-MEMS Switches In Failure Mode: Towards A More Robust Design	272
<i>T. Kuenzig, T. Muschol, J. Iannacci, G. Schrag, G. Wachutka</i>	
Thermo-Mechanical Simulation Of Plastic Deformation During Temperature Cycling Of Bond Wires For Power Electronic Modules	278
<i>A. Wright, A. Hutzler, A. Schletz, P. Pichler</i>	
Electrical Characteristics Evolution Of The Deep Trench Termination Diode Based On A Finite Elements Simulation Approach	283
<i>F. Baccar, F. Henaff, L. Theolier, S. Azzopardi, E. Woïrgard</i>	
Molecular Dynamics Simulation Of Adhesion Performance And Conformation Transition Of SAM-Modified Cu/Epoxy Interface Under Electric Field	290
<i>S. Kwok, M. Yuen</i>	
Multiphysics Study Of RF/Microwave Planar Devices: Effect Of The Input Signal Power	295
<i>M. Sanchez-Soriano, M. Edwards, Y. Quere, D. Andersson, S. Cadiou, C. Quendo</i>	
Investigation Of A Finned Baseplate Material And Thickness Variation For Thermal Performance Of A SiC Power Module	302
<i>Y. Zhang, I. Belov, M. Bakowski, J. Lim, P. Leisner, H. Nee</i>	
Thermal Characteristics Of SiC Diode Assembly To Ceramic Substrate	310
<i>R. Kisiel, M. Guziejewicz, M. Mysliwiec, J. Krasniewski, W. Janke</i>	
Theoretical And Experimental Study Of Thermal Management In High-Power AlInGaN LEDs	314
<i>A. Chernyakov, A. Zakgeim, K. Bulashevich, S. Karpov, V. Smirnov, V. Sergeev</i>	
Characterizing And Modelling The Behaviour Of An Isotropic Conductive Adhesive In View Of Electronic Assembly Fatigue Life Studies Under Thermal Cycling	319
<i>S. Pin, M. Sartor, L. Michel, J. Parain, S. Dareys</i>	
Thermo-Mechanical Stress Induced By CPI On 3D Interposer Package	326
<i>M. Lofrano, M. Gonzalez</i>	
Theoretical And Experimental Investigations On Failure Mechanisms Occuring During Long-Term Cycling Of Electrostatic Actuators	331
<i>R. Behlert, T. Kunzig, G. Schrag, G. Wachutka</i>	
A Model In Predicting Color Of LED Packages With Different Phosphor Layer Dimensions	338
<i>C. Wong, S. Leung, Y. Xiong, C. Yuan, G. Zhang</i>	
Design Aspects For CPI Robust BEOL	343
<i>M. Gonzalez, L. Kljucar, B. Vandevelde, I. Wolf, Z. Tokei</i>	
Numerical Simulations Of Piezoelectric MEMS Energy Harvesters	348
<i>G. Gafforelli, R. Ardito, A. Corigliano, C. Valzasina, F. Procopio</i>	
Analytical Tool For Electro-Thermal Modelling Of Microbolometers	357
<i>P. Zajac, C. Maj, M. Szermer, M. Lobur, A. Napieralski</i>	
Correlation Of Activation Energy Between LEDs And Luminaires In The Lumen Depreciation Test	363
<i>G. Lu, C. Yuan, X. Fan, G. Zhang</i>	
Modelling The Lifetime Of Aluminum Heavy Wire Bond Joints With A Crack Propagation Law	366
<i>A. Grams, T. Prewitz, O. Wittler, S. Schmitz, A. Middendorf, K. Lang</i>	
Thermo-Mechanical Characterization Of Passive Stress Sensors In Si Interposer	372
<i>B. Vianne, P. Bar, V. Fiori, S. Gallois-Garreignot, K. Ewuame, P. Chausse, S. Escoubas, N. Hotellier, O. Thomas</i>	
Molecular Dynamic Simulations Of Maximum Pull-Out Forces Of Embedded CNTs For Sensor Applications And Validating Nano Scale Experiments	380
<i>S. Hartmann, O. Holck, T. Blaudeck, S. Hermann, S. Schulz, T. Gessner, B. Wunderle</i>	
The Underfill-Microbump Interaction Mechanism In 3D ICs: Impact And Mitigation Of Induced Stresses	386
<i>A. Ivankovic, V. Cherman, M. Gonzalez, B. Vandevelde, D. Vandepitte, G. Beyer, E. Beyne, I. Wolf</i>	
Characterization And Modeling Of The AuCuSn Thin Solder Joint Under Thermal Cycling	394
<i>T. Pelisset, B. Karunamurthy, R. Otremba, T. Antretter</i>	
Challenges Of Viscoelastic Characterization Of Low TG Epoxy Based Adhesives For Automotive Applications In DMA And Relaxation Experiments	400
<i>I. Maus, H. Preu, M. Niessner, M. Fink, K. Jansen, R. Pantou, B. Michel, B. Wunderle</i>	
Improvement Of Freestanding CMOS-MEMS Through Detailed Stress Analysis In Metallic Layers	407
<i>S. Orellana, B. Arrazat, P. Fornara, C. Rivero, A. Giacomo, S. Blayac, K. Inal, P. Montmitonnet</i>	
Electronic Control Package Model Calibration Using Moiré Interferometry	413
<i>D. Kim, B. Han, A. Yadur, P. Gromala</i>	
A New Life-Test Equipment Designed For Medium-Duty Electromagnetic Contactors	418
<i>S. Biyik, M. Aydin</i>	

Experimental Investigation And Interpretation Of The Real Time, In Situ Stress Measurement During Transfer Molding Using The Piezoresistive Stress Chips.....	425
<i>A. Adli, K. Jansen, F. Schindler-Saeßkow, F. Rost</i>	
B-Field Characterization And Equivalent Circuit Modeling Of A Poly-SiGe-MEMS Based Xylophone Bar Magnetometer.....	429
<i>M. Farghaly, V. Rochus, X. Rottenberg, U. Mohammed, H. Tilmans</i>	
Computationally Efficient And Stable Order Reduction Method For A Large-Scale Model Of MEMS Piezoelectric Energy Harvester	435
<i>M. Kudryavtsev, E. Rudnyi, T. Bechtold, J. Korvink</i>	
Multiphysical Modeling Of Nanosecond Laser Dicing On Ultra-Thin Silicon Wafers.....	440
<i>G. Galasso, M. Kaltenbacher, B. Karunamurthy, H. Eder, T. Polster</i>	
An Analytical Model For Thermal Failure Analysis Of 3D IC Packaging	446
<i>J. Lan, M. Wu</i>	
Mechanical Analysis Of Encapsulated Metal Interconnects Under Transversal Load	451
<i>B. Keymeulen, M. Gonzalez, F. Bossuyt, J. Baets, J. Vanfleteren</i>	
Design, Technology, Numerical Simulation And Optimization Of Building Blocks Of A Micro And Nano Scale Tensile Testing Platform With Focus On A Piezoresistive Force Sensor	459
<i>P. Meszmer, K. Hiller, D. May, S. Hartmann, A. Shaporin, J. Mehner, B. Wunderle</i>	
Study On Configuration Design Of Interconnection In High Power Module.....	469
<i>L. Liao, T. Hung, C. Liu, Y. Su, K. Chiang</i>	
2-Gb/s/pin DDR3 Memory Channel Design And Simulation For Carbon Reduction	473
<i>N. Chen</i>	
System-Level-Model Development Of An SWCNT Based Piezoresistive Sensor In VHDL-AMS.....	481
<i>V. Kolchuzhin, J. Mehner, E. Markert, U. Heinkel, C. Wagner, J. Schuster, T. Gessner</i>	
FEM Simulation And Measurement Validation Of A cMUT Cell.....	487
<i>S. Mao, X. Rottenberg, V. Rochus, B. Nauwelaers, H. Tilmans</i>	
Microstructure Simulation Of Grain Growth In Cu Through Silicon Via Using Phase-Field Modeling.....	494
<i>N. Nabiollahi, N. Moelans, M. Gonzalez, J. Messemaker, C. Wilson, K. Croes, E. Beyne, I. Wolf</i>	
Compact Thermal Modeling Of Microbolometers.....	498
<i>M. Janicki, P. Zajac, M. Szermer, A. Napieralski</i>	
MedeA®: Atomistic Simulations For Designing And Testing Materials For Micro/Nano Electronics Systems	502
<i>A. France-Lanord, D. Rigby, A. Mavromaras, V. Eyert, P. Saxe, C. Freeman, E. Wimmer</i>	
FEM Stress Analysis Of Various Solar Module Concepts Under Temperature Cycling Load.....	510
<i>F. Kraemer, S. Wiese</i>	
FEM Wire Bonding Simulation For Sensor Chip Applications.....	518
<i>F. Kraemer, S. Wiese</i>	
Mechanical Stress Analysis In Photovoltaic Cells During The String-Ribbon Interconnection Process.....	524
<i>F. Kraemer, J. Seib, E. Peter, S. Wiese</i>	
Analytical Stress Model For Tin Based Solder Material	531
<i>M. Guyenot, A. Fix</i>	
A Crack Analysis Model For Silicon Based Solar Cells.....	538
<i>J. Ahmar, S. Wiese</i>	
Effect Of Laminar Air Flow On Probe Burn For Spring Probe.....	543
<i>B. Zafer, B. Tunaboylu</i>	
Thermal Management Of Electrical Overload Cases Using Thermo-Electric Modules And Phase Change Buffer Techniques: Simulation, Technology and Testing.....	547
<i>M. Springborn, B. Wunderle, D. May, R. Mrossko, C. Manier, H. Oppermann, M. Ras, R. Mitova</i>	
Simulation And Measurement Of Pressure Dependent Q-Factors In NEMS Resonators.....	558
<i>J. Manz, G. Schrag, G. Wachutka</i>	
Electro-Thermal Characterization Of Through-Silicon Vias:	563
<i>A. Todri-Sanial</i>	
Experimental Investigation Of The Visco-Plastic Mechanical Properties Of A Sn-Based Solder Alloy For Material Modelling In Finite Element Calculations Of Automotive Electronics	569
<i>R. Metaseh, M. Roellig, A. Kabakchiev, B. Metais, R. Ratchev, K. Meier, K. Wolter</i>	
Analysis Of Mechanical Properties Of Thermal Cycled Cu Plated-Through Holes (PTH)	577
<i>H. Walter, A. Kaltwasser, M. Broll, S. Huber, O. Wittler, K. Lang</i>	
Failure Mode Analysis And Optimization Of Assembled High Temperature Pressure Sensors	584
<i>R. Zeiser, S. Ayub, M. Berndt, J. Muller, J. Wilde</i>	
Reliability Study On Chip Capacitor Solder Joints Under Thermo-Mechanical And Vibration Loading.....	590
<i>K. Meier, M. Roellig, A. Schiessl, K. Wolter</i>	

Modeling Of SiC Power Modules With Double Sided Cooling	597
<i>K. Brinkfeldt, K. Neumaier, A. Mann, O. Zschieschang, A. Otto, E. Kaulfersch, M. Edwards, D. Andersson</i>	
Modeling And Simulation Of Monolithic Integration Of Rectifiers For Solid State Lighting Applications.....	603
<i>M. Veknatesh, P. Liu, H. Zeijl, G. Zhang</i>	
Microactuator Modeling To Develop A New Template For The Braille.....	609
<i>S. Soulimane, M. Nigassa, B. Bouazza, H. Camon</i>	
Multiphysics Modelling Of The Fabrication And Operation Of A Micro-Pellistor Device.....	612
<i>F. Biro, Z. Hajnal, A. Pap, I. Barsony</i>	
Determination Of Residual Stress With High Spatial Resolution At TSVs For 3D Integration: Comparison Between HR-XRD, Raman Spectroscopy And fibDAC	618
<i>D. Vogel, U. Zschenderlein, E. Auerswald, O. Holck, P. Ramm, B. Wunderle, R. Pufall</i>	
Modelling, Simulation and Optimization For A SThm Nanoprobe.....	626
<i>B. Yang, M. Lenczner, S. Cogan, F. Menges, H. Riel, B. Gotsmann, P. Janus, G. Boetch</i>	
Combined Experimental - And FE - Studies On Sinter-Ag Behaviour And Effects On IGBT-Module Reliability	632
<i>R. Dudek, R. Doring, P. Sommer, B. Seiler, K. Kreyssig, H. Walter, M. Becker, M. Gunther</i>	
Fluid Damping In Compliant, Comb-Actuated Torsional Micromirrors	641
<i>R. Mirzazadeh, S. Mariani, A. Ghisi, M. Fazio</i>	
New Equivalent Stress Describes The Dicing Caused Anisotropic Breaking Strength Of Silicon Dies.....	648
<i>M. Steiert, J. Wilde</i>	
Accurate Prediction Of SnAgCu Solder Joint Fatigue Of QFP Packages For Thermal Cycling.....	656
<i>M. Niessner, G. Schuetz, C. Birzer, H. Preu, L. Weiss</i>	
Thermo-Mechanical Properties Of Underfills At Partial And Full Filler Percolation - Sub-Layering The Underfill.....	662
<i>G. Schlottig, M. Haupt, S. Zimmermann, J. Zurcher, T. Brunschwiler</i>	
Hidden Head-In-Pillow Soldering Failures	669
<i>B. Vandevelde, G. Willems, B. Allaert</i>	
Reliability And Accelerated Test Methods For Plastic Materials In LED-Based Products	675
<i>M. Mehr, W. Driel, G. Zhang</i>	
Finite Element Multi-Physics Modeling For Ohmic Contact Of Microswitches	680
<i>H. Liu, D. Leray, P. Pons, S. Colin</i>	
GaN-Based LEDs: State Of The Art And Reliability-Limiting Mechanisms	688
<i>E. Zanoni, M. Meneghini, N. Trivellin, M. Lago, G. Meneghesso</i>	
System Reliability For LED-Based Products	693
<i>J. Davis, K. Mills, M. Lamvik, R. Yaga, S. Shepherd, J. Bittle, N. Baldasaro, E. Solano, G. Bobashev, C. Johnson, A. Evans</i>	
Assessment Of Microelectronics Interconnect Reliability - Current Practice And Trends.....	700
<i>P. Borgesen</i>	
Design For Thermo-Mechanical Reliability Of A 3D Microelectronic Component Using 3D FEM.....	705
<i>S. Belhenini, A. Tougui, F. Dosseul</i>	
Numerical Modeling Of Flexible Actuator For Dynamic Lighting.....	711
<i>T. Ma, X. Li, J. Wei, G. Zhang, P. Sarro</i>	
Thermal Performance Of Embedded Heat Pipe In High Power Density LED Streetlight Module.....	715
<i>H. Tang, J. Zhao, B. Li, S. Leung, C. Yuan, G. Zhang</i>	
Author Index	