Foreword

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Biographical notes: Sung Yi holds a Professor position at the Mechanical and Material Engineering Department of Portland State University, USA. He received his PhD degree from the University of Illinois at Urbana-Champaign in 1992. From 2006 to 2009, he was the Vice President at Samsung Electro-Mechanics Co., LTD, Korea. Since 1998, he is an editorial advisory board member for the journal *Soldering & Surface Mount Technology*. He received the Jefferson Goblet Paper Award at the 32nd SDM Conference in 1991 and the Roger A. Strehlow Memorial Award from UIUC in 1992, respectively. He also received Hedong Technology Award in 2007.

Jeong Han Kim is the Director of the National Roots and Industry Promotion Center in Korea Institute of Industrial Technology Korea. He received his PhD degree from Colorado School of Mining in 1992. Since then, he has been working at KITECH. He also served as a Director of the Micro-Joining Center and KITECH USA.

The special issue covers the recent studies on the reliability of microelectronic materials and devices. It includes a total of nine refereed papers. The first paper is by Y.F. Chu, S. Yi and P. Geng and it evaluates the fatigue life of solder joints of plastic ball grid array packages (PBGA) under thermal cycling conditions based on the matrix dislocation mechanism and grain boundary sliding model. There then follows a paper by K. Nakahira, H. Tago, T. Sasaki, K. Suzuki and H. Miura which reports the local residual stress in a silicon chip with various bump pitches measured by piezoresistive strain gauges embedded in the sensor chips. The third paper, by Y. Ju, H. Yamauchi, H. Oshima and K. Tanaka, reports the reflow of lead-free solder by microwave heating at 2.45 GHz frequency on TE₁₀ mode. There then follow five papers with a focus on the reliability of lead-free solders and their joints. The first, by A-M. Yu, J-W. Jang, J-H. Lee, J-K. Kim and M-S. Kim, reports the drop/shock reliability of new quaternary Sn-Ag-Cu-In Pb-free solder alloy with copper. In the second of these five papers, Y-H. Ko, S. Yoo and C-W. Lee discuss the reliability of Sn-3.5Ag and Sn-0.7Cu solders under vibration at elevated temperature. Then, S. Yi reports that the shear strength of solder joints with Sn

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96.5/Ag3.0/Cu0.5 and 95.5/Ag3.8/Cu0.7 solder pastes. The next paper, by Y. Kim, J. Yoon, and S-B. Jung, studies the effects of Pd layer thickness in ENEPIG surface finish on the bonding strength of solder joints. In the last of these five papers, J-W. Jang, S-H. Yoo, H-S. Lee, C-W. Lee, M-S. Kim and J-K. Kim, continue to discuss the effect of reflow peak temperatures on the mechanical drop performance of Sn-58Bi solder joints. These five papers are then followed by a paper from R. Zanma and M. Saka, who report two Al micro wires fabrication by utilising electromigration and the great possibility to fabricate a large amount of Al micro materials.

The editors express their sincere thanks to all the authors who have contributed to the special issue. This special issue helps identify future directions of research and development in the reliability of microelectronics materials and devices. It is our earnest hope that the publication of this special issue will help broaden awareness within the engineering community of the recent advances in microelectronic packaging and will serve the profession well.