

IEEE TRANSACTIONS ON COMPONENTS, PACKAGING, AND MANUFACTURING TECHNOLOGY

A PUBLICATION OF THE COMPONENTS, PACKAGING, AND MANUFACTURING TECHNOLOGY SOCIETY



IEEE COMPONENTS, PACKAGING, AND
MANUFACTURING TECHNOLOGY SOCIETY

WWW.CPMT.ORG

JULY 2016
AUGUST 2016

VOLUME 6
VOLUME 6

NUMBER 7
NUMBER 8

ITCPC8

(ISSN 2156-3950)

For the July 2016 issue, see p. 969 for Table of Contents.

For the August 2016 issue, see p. 1137 for Table of Contents.

IEEE TRANSACTIONS ON COMPONENTS, PACKAGING, AND MANUFACTURING TECHNOLOGY

A PUBLICATION OF THE COMPONENTS, PACKAGING, AND MANUFACTURING TECHNOLOGY SOCIETY



IEEE COMPONENTS, PACKAGING, AND
MANUFACTURING TECHNOLOGY SOCIETY

WWW.CPMT.ORG

JULY 2016

VOLUME 6

NUMBER 7

ITCPC8

(ISSN 2156-3950)

SPECIAL SECTION ON 3-D INTEGRATION

FOREWORD

Special Section on 3-D Integration *M. S. Bakir and R. Mahajan* 973

SPECIAL SECTION PAPERS

Heterogeneous Integration for Performance and Scaling *S. S. Iyer* 975

Reliable Via-Middle Copper Through-Silicon Via Technology for 3-D Integration *E. Beyne* 985

Experimental Stress Characterization and Numerical Simulation for Copper Pumping Analysis of Through-Silicon Vias *X. Liu, P. A. Thadesar, C. L. Taylor, M. Kunz, N. Tamura, M. S. Bakir, and S. K. Sitaraman* 995

Heterogeneous 3-D Integration Using Self-Assembly and Electrostatic Bonding *M. Koyanagi, T. Fukushima, K.-W. Lee, and T. Tanaka* 1002

Through-Silicon Vias: Drivers, Performance, and Innovations *P. A. Thadesar, X. Gu, R. Alapati, and M. S. Bakir* 1009

On-Board Silicon Photonics-Based Transceivers With 1-Tb/s Capacity *S. Bernabé, K. Rida, G. Parès, O. Castany, D. Fowler, C. Kopp, G. Waltener, J. Gonzalez Jimenez, and S. Menezo* 1020

REGULAR PAPERS

Components: Characterization and Modeling

An Analytical Model for Steady-State and Transient Temperature Fields in 3-D Integrated Circuits *K. Wang and Z. Pan* 1028

Electrothermal Modeling for 3-D Nanoscale Circuit Substrates: Noise *Y. Ma, L. Fakri-Bouchet, F. Calmon, and C. Gontrand* 1042

A Novel Flat Micro Heat Pipe With a Patterned Glass Cover *Y. Luo, B. Yu, X. Wang, and C. Li* 1053

Design and Modeling of Membrane-Based Evaporative Cooling Devices for Thermal Management of High Heat Fluxes *Z. Lu, T. R. Salamon, S. Narayanan, K. R. Bagnall, D. F. Hanks, D. S. Antao, B. Barabadi, J. Sircar, M. E. Simon, and E. N. Wang* 1058

Contribution to the Study of Electric Arcs in Lithium-Ion Batteries *A. Augeard, T. Singo, P. Desprez, and M. Abbaoui* 1068

(Contents Continued on Page 972)

Electrical Performance of Integrated Systems

A Novel Transmission Line Structure for High-Speed High-Density Copper Interconnects	Z. A. Khan	1079
Modeling and Simulation of Planes With Decoupling Capacitors	J. Wang, J. Lu, X. Chu, Y. Liu, and Y. Li	1089
Triple-Mode Bandpass Filters on CSRR-Loaded Substrate Integrated Waveguide Cavities		
.....	Z. Liu, G. Xiao, and L. Zhu	1101
A Novel Microwave Attenuator on Multilayered Substrate Integrated Waveguide	Z. Liu, L. Zhu, and G. Xiao	1108
General Dual-Band Impedance Transformer With a Selectable Transmission Zero	M.-L. Chuang and M.-T. Wu	1115

Electronics Manufacturing

CPI Parametric Investigation of UBM–Al Interface for Cu Pillar Flip-Chip Application		
.....	P. Lianto, H. Y. Li, R. Balamurugan, J. Wei, N. B. Jaafar, L. C. Eva Wai, and A. Sundarrajan	1122
Effects of Polymer Ball Size and Polyvinylidene Fluoride Nanofiber on the Ball Capture Rate for 100- μ m-Pitch Flex-on-Flex Assembly Using Anisotropic Conductive Films and Ultrasonic Bonding Method		
.....	J.-H. Park, T.-W. Kim, S. Zhang, and K.-W. Paik	1129
