

Contents

Part I Future of Packaging

1	Packaging for Electronic Systems	3
	Gerald Gerlach	
2	System Integration by Advanced Electronics Packaging.	31
	Klaus-Jürgen Wolter	
3	Nano- and Biotechniques for Electronic Device Packaging	49
	Gerald Gerlach	

Part II 3D Modelling and Design for NEMS

4	3D Design	79
	Jens Lienig	
5	3D Data Structures for Nanoscale Design	97
	Robert Fischbach	
6	Uncertainty-Based Design Optimization of MEMS/NEMS	119
	Holger Neubert	

Part III Nanoparticles and Confined Nanosystems

7	Physical Effects of Nanoparticles and Nanoparticle Ensembles: Impact to System Packaging	141
	Lukas M. Eng	

8	Photochemical Metallization at the Nanoscale	155
	Thomas Härtling	

Part IV Nanopatterning for NEMS

9	Nanopatterning and Self-Assembly in Microsystems: An Overview	179
	Wolf-Joachim Fischer and Michael Mertig	
10	Direct Nanoimprinting for Micro- and Nanosystems	209
	Robert Kirchner, Jonathan Derix, Andreas Nocke and René Landgraf	
11	Platform Technologies for Pico-liter Printing and Nano-imprinting	243
	Steffen Howitz and Thomas Wegener	
12	Nanosphere Lithography	269
	Martin Waegner	
13	Nano Lithography Based on Domain Patterning of Ferroelectrics	279
	Alexander Haußmann	
14	Ink-Jet Printing of Conductive Nanostructures	293
	Alexander Türke	
15	Nanoparticle-Based Resistors and Conductors	305
	Andreas Nocke and Marcus Wolf	
16	Self-Assembly of Nanowire-Based Field-Effect Transistors	319
	Juliane Posseckardt and Michael Mertig	

Part V Nano- and Bio-Functionalized Surfaces

17	Interfacing of Biosystems	337
	Gerhard Rödel and Wolfgang Pompe	
18	Optical Absorption Layers for Infrared Radiation	355
	Marco Schossig	

19 Packaging in Synthetic Biology	383
Jakob Schweizer, Matthias Garten and Petra Schwillie	
20 S-Layer Proteins as Self-Assembly Tool in Nano Bio Technology	419
Melinda Varga and Nuriye Korkmaz	
21 Biofunctionalization of Surfaces Using Ultrathin Nanoscopic Collagen Matrices.	427
Jens Friedrichs, Anna Taubenberger, Susanne Wegmann, David A. Cisneros, Clemens Franz and Daniel J. Müller	
 Part VI Biocompatible Materials and Packaging	
22 Electromagnetic Aspects in Cell Biology	445
Richard H. W. Funk	
23 DC Electrodes for Cell Applications	473
Jonathan Derix and Srikanth Perike	
24 Biocompatibility of Packaging Materials	491
Jürgen Uhlemann, Robert Kirchner and Klaus-Jürgen Wolter	
25 Biostability of Electronic Packaging Materials.	515
Nataliia Beshchasna	
 Part VII System-in-Package for MEMS, Bio-MEMS and MOEMS	
26 Scaling Effects for Miniaturized Solder Interconnects in Electronic Packages	525
Maik Müller and Klaus-Jürgen Wolter	
27 Photonic System Integration of Optical Waveguides in MOEMS	539
Ralf Rieske	
28 Biosensing with Optical Waveguides	557
Tobias Schuster, René Landgraf, Andreas Finn and Michael Mertig	

29	Direct Encapsulation of OLED on CMOS	581
	Christian Schmidt	
30	A Hierarchical Modeling Approach of Thermal Vias Using CNT-Based Composites	601
	Jörg Hertwig, Holger Neubert and Jens Lienig	
	Index	621

Bio and Nano Packaging Techniques for Electron
Devices

Advances in Electronic Device Packaging

Gerlach, G.; Wolter, K.-J. (Eds.)

2012, XII, 628 p., Hardcover

ISBN: 978-3-642-28521-9