

Contents

Part I MOS

1	High-k Dielectric for Nanoscale MOS Devices	3
	Ling-Xuan Qian	
2	Challenge of High Performance Bandgap Reference Design in Nanoscale CMOS Technology	45
	Zhang Jun-an, Li Guangjun, Zhang Rui-tao, Yang Yu-jun, Li Xi, Yan Bo, Fu Dong-bing, and Luo Pu	
3	Metal Oxide Semiconductor Thin-Film Transistors: Device Physics and Compact Modeling	69
	Wanling Deng, Jielin Fang, Xixiong Wei, and Fei Yu	
4	AC Random Telegraph Noise (AC RTN) in Nanoscale MOS Devices	99
	Jibin Zou, Shaofeng Guo, Ru Huang, and Runsheng Wang	
5	Passivation and Characterization in High-k/III–V Interfaces	123
	Shengkai Wang and Honggang Liu	
6	Low Trigger Voltage and High Turn-On Speed SCR for ESD Protection in Nanometer Technology	151
	Jizhi Liu, Zhiwei Liu, Fei Hou, Hui Cheng, Liu Zhao, and Rui Tian	
7	Silicon-Based Junctionless MOSFETs: Device Physics, Performance Boosters and Variations	183
	Xinnan Lin, Haijun Lou, Ying Xiao, Wenbo Wan, Lining Zhang, and Mansun Chan	

Part II Sensor

- 8 **Effect of Nanoscale Structure on Reliability of Nano Devices and Sensors** 239
Jaya Madan and Rishu Chaujar
- 9 **MEMS/NEMS-Enabled Vibrational Energy Harvesting for Self-Powered and Wearable Electronics** 271
Kai Tao, Jin Wu, Ajay Giri Prakash Kottapalli, Sun Woh Lye, and Jianmin Miao
- 10 **The Application of Graphene in Biosensors** 299
Ting Li, Zebin Li, Jinhao Zhou, Boan Pan, Xiao Xiao, Zhaojia Guo, Lanhui Wu, and Yuanfu Chen
- 11 **Modelling and Optimization of Inertial Sensor-Accelerometer** 331
Zakriya Mohammed, Waqas Amin Gill, and Mahmoud Rasras
- 12 **Graphene for Future High-Performance Gas Sensing** 347
Jin Wu, Kai Tao, Jianmin Miao, and Leslie K. Norford
- 13 **Nanoporous Palladium Films Based Resistive Hydrogen Sensors** 365
Shuanghong Wu, Han Zhou, Mengmeng Hao, and Zhi Chen

Part III Nanostructured Oxide

- 14 **Microstructure of the Nanostructured Oxide Composite Thin Films and Its Functional Properties** 397
Xingkun Ning
- 15 **Fabrication and Characterizations of Bi₂Te₃ Based Topological Insulator Nanomaterials** 429
Z.H. Wang, Xuan P.A. Gao, and Z.D. Zhang

Part IV Other Nanoscale Devices

- 16 **Micro/Nanoscale Optical Devices for Hyperspectral Imaging System** 459
Li Li, Chengjun Huang, and Haiying Zhang
- 17 **Fabrication and Physical Properties of Nanoscale Spin Devices Based on Organic Semiconductors** 483
Xianmin Zhang

Outlook and Challenges of Nano Devices, Sensors, and
MEMS

Li, T.; Liu, Z. (Eds.)

2017, XVI, 521 p. 367 illus., 272 illus. in color.,

Hardcover

ISBN: 978-3-319-50822-1