

Special Issue on Beyond Moore: Three-Dimensional (3D) Heterogeneous Integration

■ RESEARCH HIGHLIGHTS

020201 **Multidimensional perovskites enhance solar cell performance**

[3 pages] Wenzhe Li, Jiandong Fan, and Liming Ding

■ COMMENTS AND OPINIONS

020301 **Design technology co-optimization towards sub-3 nm technology nodes**

[3 pages] Genquan Han and Yue Hao

■ SHORT COMMUNICATION

020501 **Inorganic perovskite/organic tandem solar cells with efficiency over 20%**

[4 pages] Ling Liu, Zuo Xiao, Chuantian Zuo, and Liming Ding

020502 **62 GHz germanium photodetector with inductive gain peaking electrode for photonic receiving beyond 100 Gbaud**

[3 pages] Dingyi Wu, Xiao Hu, Weizhong Li, Daigao Chen, Lei Wang, and Xi Xiao

■ EDITORIAL

020101 **Preface to the Special Issue on Beyond Moore: Three-Dimensional (3D) Heterogeneous Integration**

[2 pages] Yue Hao, Huaqiang Wu, Yuchao Yang, Qi Liu, Xiao Gong, Genquan Han, and Ming Li

■ REVIEWS

023101 **Mobility enhancement techniques for Ge and GeSn MOSFETs**

[9 pages] Ran Cheng, Zhuo Chen, Sicong Yuan, Mitsuru Takenaka, Shinichi Takagi, Genquan Han, and Rui Zhang

023102 **The past and future of multi-gate field-effect transistors: Process challenges and reliability issues**

[11 pages] Ying Sun, Xiao Yu, Rui Zhang, Bing Chen, and Ran Cheng

023103 **Photoic crystal nanobeam cavity devices for on-chip integrated silicon photonics**

[11 pages] Daquan Yang, Xiao Liu, Xiaogang Li, Bing Duan, Aiqiang Wang, and Yunfeng Xiao

023104 **Towards electronic-photonic-converged thermo-optic feedback tuning**

[13 pages] Min Tan, Kaixuan Ye, Da Ming, Yuhang Wang, Zhicheng Wang, Li Jin, and Junbo Feng

023105 **A review: Photonics devices, architectures, and algorithms for optical neural computing**

[16 pages] Shuiying Xiang, Yanan Han, Ziwei Song, Xingxing Guo, Yahui Zhang, Zhenxing Ren, Suhong Wang, Yuanting Ma, Weiwen Zou, Bowen Ma, Shaofu Xu, Jianji Dong, Hailong Zhou, Quansheng Ren, Tao Deng, Yan Liu, Genquan Han, and Yue Hao

023106 **A review of silicon-based wafer bonding processes, an approach to realize the monolithic integration of Si-CMOS and III–V-on-Si wafers**

[20 pages] Shuyu Bao, Yue Wang, Khaw Lina, Li Zhang, Bing Wang, Wardhana Aji Sasangka, Kenneth Eng Kian Lee, Soo Jin Chua, Jurgen Michel, Eugene Fitzgerald, Chuan Seng Tan, and Kwang Hong Lee

■ **ARTICLES**

024101 **Enhancement of refresh time in quasi-nonvolatile memory by the density of states engineering**

[6 pages] Zhaowu Tang, Chunsen Liu, Senfeng Zeng, Xiaohe Huang, Liwei Liu, Jiayi Li, Yugang Jiang, David Wei Zhang, and Peng Zhou

024102 **The effect of γ -ray irradiation on the SOT magnetic films and Hall devices**

[5 pages] Tengzhi Yang, Yan Cui, Yanru Li, Meiyin Yang, Jing Xu, Huiming He, Shiyu Wang, Jing Zhang, and Jun Luo

024103 **Integration of GaN analog building blocks on p-GaN wafers for GaN ICs**

[4 pages] Xiangdong Li, Karen Geens, Nooshin Amirifar, Ming Zhao, Shuzhen You, Niels Posthuma, Hu Liang, Guido Groeseneken, and Stefaan Decoutere