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Nota di contenuto	CONTENTS; Preface; Simulation and Experimental Results on GaN Based Ultra-Short Planar Negative Differential Conductivity Diodes for THz Power Generation B. Aslan, L. F. Eastman and Q. Diduck; 1. Introduction; 2. Simulation Results; 3. Experimental results and discussion; 4. Conclusion; References; 5-Terminal THz GaN Based Transistor with Field- and Space-Charge Control Electrodes G. Simin, M. S. Shur and R. Gaska; 1. Introduction; 2. GaN Heterostructure Field-Effect Transistors; 3. Proposed novel five-terminal GaN based THz HFET; 4. Acknowledgement; References Performance Comparison of Scaled III-V and Si Ballistic Nanowire MOSFETs L. Wang, B. Yu, P. M. Asbeck, Y. Taur and M. Rodwell1. Introduction; 2. Numerical Simulation; 3. Analysis and Discussion; 4. Conclusions; 5. Acknowledgement; References; A Room Temperature

Ballistic Deflection Transistor for High Performance Applications Q. Diduck, H. Irie and M. Margala; 1. Introduction; 2. Background; 3. Theory of Operation; 4. Experiments and Results; 5. Conclusion; Acknowledgments; References

Emission and Intensity Modulation of Terahertz Electromagnetic Radiation Utilizing 2-Dimensional Plasmons in Dual-Grating-Gate HEMT's T. Otsuji, T. Nishimura, Y. Tsuda, Y. M. Meziani, T. Suemitsu and E. Sano1. Introduction; 2. Plasmon-Resonant Terahertz Emitter; 2.1. Device structure and operation principle; 2.2. Characteristic parameters and design scheme; 2.3. Device fabrication; 2.4. Experimental Results and Discussions; 2.4.1. DC-current-driven self oscillation; 2.4.2. CW-pumped optically excited stimulated terahertz emission; 2.4.3. Two-photon injection-locked difference-frequency terahertz emission; 2.4.4. Impulsive laser excited terahertz emission; 3. Terahertz Intensity Modulator Based on Controlling 2D Plasmon Dispersion; 4. Conclusion; Acknowledgements; References; Millimeter Wave to Terahertz in CMOS K. K. O, S. Sankaran, C. Cao, E.-Y. Seok, D. Shim, C. Mao and R. Han; 1. Introduction; 2. Transistors and Diodes in CMOS; 2.1. Speed Performance of NMOS Transistor; 2.2. Schottky Diode and Other devices for THz detection; 3. Signal Sources; 3.1. A. Fundamental Mode VCO; 3.2. Push-Push VCO; 3.3. Phase Locked Loop; 4. Detector Circuits; 5. Conclusions; 6. Acknowledgments; References; The Effects of Increasing AlN Mole Fraction on the Performance of AlGaN Active Regions Containing Nanometer Scale Compositionally Inhomogeneities A. V. Sampath, M. L. Reed, C. Moe, G. A. Garrett, E. D. Readinger, W. L. Sarney, H. Shen, M. Wraback, C. Ch; 1. Introduction; 2. Method; 3. Results; 3.1. Temperature dependent cw-PL studies; 3.2. Time resolved photoluminescence studies; 3.3. Transmission electron microscopy studies; 3.4. 290 nm Double Heterostructure Ultraviolet Light Emitting Diodes; 4. Discussion; 5. Conclusions; 6. Acknowledgements

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## Sommario/riassunto

Advanced High Speed Devices covers five areas of advanced device technology : terahertz and high speed electronics, ultraviolet emitters and detectors, advanced III-V field effect transistors, III-N materials and devices, and SiC devices. These emerging areas have attracted a lot of attention and the up-to-date results presented in the book will be of interest to most device and electronics engineers and scientists. The contributors range from prominent academics, such as Professor Lester Eastman, to key US Government scientists, such as Dr Michael Wraback.

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