

SPECIAL ISSUE

TERAHERTZ RF ELECTRONICS AND SYSTEM INTEGRATION

Edited by T. W. Crowe, W. R. Deal, M. Schröter, C.-K. C. Tzuang, and K. Wu

- 990 THz Diode Technology: Status, Prospects, and Applications**
By I. Mehdi, J. V. Siles, C. Lee, and E. Schlecht
|INVITED PAPER| This paper describes the current status of GaAs Schottky diode technology including operation, performance, and application to mixers and multipliers.

- 1008 Status and Prospects of High-Power Heterostructure Barrier Varactor Frequency Multipliers**
By J. Stake, A. Malko, T. Bryllert, and J. Vukusic
|INVITED PAPER| The paper provides an overview of the heterostructure barrier varactor (HBV) and its application to frequency multipliers.

- 1020 Advanced Terahertz Sensing and Imaging Systems Based on Integrated III-V Interband Tunneling Devices**
By L. Liu, S. M. Rahman, Z. Jiang, W. Li, and P. Fay
|INVITED PAPER| This paper describes a novel diode for detector applications at submillimeter-wave frequencies.

- 1035 Si/SiGe:C and InP/GaAsSb Heterojunction Bipolar Transistors for THz Applications**
By P. Chevalier, M. Schröter, C. R. Bolognesi, V. d'Alessandro, M. Alexandrova, J. Böck, R. Flückiger, S. Fregonese, B. Heinemann, C. Jungemann, R. Lövblom, C. Maneux, O. Ostinelli, A. Pawlak, N. Rinaldi, H. Rücker, G. Wedel, and T. Zimmer
|INVITED PAPER| This paper describes Si/SiGe:C and InP/GaAsSb heterojunction bipolar transistors (HBTs), and provides information on thermal and substrate effects, reliability, and radio-frequency (RF) performance.

- 1051 InP HBT Technologies for THz Integrated Circuits**
By M. Urteaga, Z. Griffith, M. Seo, J. Hacker, and M. J. W. Rodwell
|INVITED PAPER| This paper describes the operation and scaling of InP heterojunction bipolar transistors (HBTs) to terahertz frequencies.

- 1068 SiGe HBT Technology: Future Trends and TCAD-Based Roadmap**
By M. Schröter, T. Rosenbaum, P. Chevalier, B. Heinemann, S. P. Voinigescu, E. Preisler, J. Böck, and A. Mukherjee
|INVITED PAPER| This paper presents a technology roadmap for the electrical performance of high-speed silicon-germanium (SiGe) heterojunction bipolar transistors (HBTs).

- 1087 Silicon Millimeter-Wave, Terahertz, and High-Speed Fiber-Optic Device and Benchmark Circuit Scaling Through the 2030 ITRS Horizon**
By S. P. Voinigescu, S. Shopov, J. Bateman, H. Farooq, J. Hoffman, and K. Vasilakopoulos
|INVITED PAPER| This paper reviews the technology requirements of future 100–300-GHz millimeter-wave systems-on-chip for various applications.

- 1105 Silicon-on-Insulator Substrates as a Micromachining Platform for Advanced Terahertz Circuits**
By N. S. Barker, M. Bauwens, A. Lichtenberger, and R. Weikle, II
|INVITED PAPER| This paper considers the development of terahertz systems-on-chip using micromachining techniques based on silicon-on-insulator technology.

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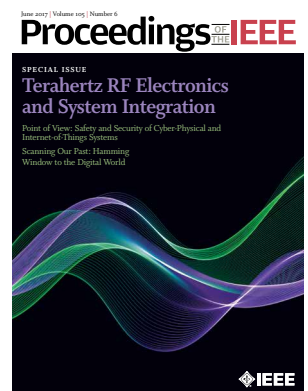
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By M. Wolf and D. Serpanos

- 985 SCANNING THE ISSUE**
Terahertz RF Electronics and System Integration
By T. W. Crowe, W. R. Deal, M. Schröter, C.-K. C. Tzuang, and K. Wu

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- 1191 FUTURE SPECIAL ISSUE/ SPECIAL SECTIONS**



On the Cover: Our cover this month highlights the focus of the special issue by portraying an artist's rendition of terahertz waves.

SPECIAL ISSUE: Terahertz RF Electronics and System Integration

1121 Packages for Terahertz Electronics

By *H.-J. Song*

|INVITED PAPER| This paper provides an overview of recent progress in interconnections and packaging technologies for the practical use of terahertz electronic devices and integrated circuits.

1139 Micromachined Packaging for Terahertz Systems

By *G. Chattopadhyay, T. Reck, C. Lee, and C. Jung-Kubiak*

|INVITED PAPER| This paper highlights key developments in the use of micromachining techniques for the packaging of terahertz frequency systems.

1151 Metrology State-of-the-Art and Challenges in Broadband Phase-Sensitive Terahertz Measurements

By *M. Naftaly, R. G. Clarke, D. A. Humphreys, and N. M. Ridler*

|INVITED PAPER| The paper reviews the state of the art and challenges of terahertz metrology in both free-space and waveguide-based instrumentation. In particular, it discusses the instrumental and methodological disconnect between the two platforms, and the barriers to establishing interoperability.

1166 Terahertz Reflecting and Transmitting Metasurfaces

By *S.-W. Qu, H. Yi, B. J. Chen, K. B. Ng, and C. H. Chan*

|INVITED PAPER| This paper reviews developments in wave manipulation from microwave to optical frequencies, together with new results in the terahertz regime.

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