

# 2020 Index

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This index covers all technical items—papers, correspondence, reviews, etc.—that appeared in this periodical during 2020, and items from previous years that were commented upon or corrected in 2020. Departments and other items may also be covered if they have been judged to have archival value.

The Author Index contains the primary entry for each item, listed under the first author's name. The primary entry includes the coauthors' names, the title of the paper or other item, and its location, specified by the publication abbreviation, year, month, and inclusive pagination. The Subject Index contains entries describing the item under all appropriate subject headings, plus the first author's name, the publication abbreviation, month, and year, and inclusive pages. Note that the item title is found only under the primary entry in the Author Index.

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- Analysis of an AlGaIn/AlN Super-Lattice Buffer Concept for 650-V Low-Dispersion and High-Reliability GaN HEMTs. *Heuken, L.*, +, *TED March 2020* 1113-1119
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- Analysis of MIS-HEMT Device Edge Behavior for GaN Technology Using New Differential Method. *Kammeugne, R.K.*, +, *TED Nov. 2020* 4649-4653
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- Augmentation and Assessment of a Universal FET *I-V* Model for Simulating GaN HEMTs. *Dasari, P.*, +, *TED March 2020* 847-854
- Band Variations Caused by Strain Effects for Quantum Wires With Arbitrary Orientations. *Cihak, H.L.*, +, *TED Jan. 2020* 270-276
- Bias-Dependent Electron Velocity Extracted From N-Polar GaN Deep Recess HEMTs. *Romanczyk, B.*, +, *TED April 2020* 1542-1546
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- Comparison of Dark Current Random Telegraph Signals in Silicon and InSb-Based Photodetector Pixel Arrays. *Durnez, C.*, +, *TED Nov. 2020* 4940-4946
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- Design of a  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> Schottky Barrier Diode With p-Type III-Nitride Guard Ring for Enhanced Breakdown. *Roy, S.*, +, *TED Nov. 2020 4842-4848*
- Design of GaN/AlGaIn/GaN Super-Heterojunction Schottky Diode. *Han, S.*, +, *TED Jan. 2020 69-74*
- Design of On-Wafer TRL Calibration Kit for InP Technologies Characterization up to 500 GHz. *Deng, M.*, +, *TED Dec. 2020 5441-5447*
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- Efficiency Enhancement of Perovskite Solar Cells Using Heterojunction Bipolar Transistor Configuration. *Wahid, S.*, +, *TED Feb. 2020 552-557*
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- Experimental Study on the Short-Circuit Instability of Cascade GaN HEMTs. *Xue, P.*, +, *TED April 2020 1686-1692*
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- Ge-GaAs-Ge Heterojunction MOSFETs for Mixed-Signal Applications. *Mech, B.C.*, +, *TED Sept. 2020 3585-3591*
- Geometric Modeling of Thermal Resistance in GaN HEMTs on Silicon. *Gonzalez, B.*, +, *TED Dec. 2020 5408-5414*
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- High Output Power GaN-Based Green Resonant-Cavity Light-Emitting Diodes With Trapezoidal Quantum Wells. *Wu, H.*, +, *TED Sept. 2020 3650-3654*
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- High-Performance Ultrathin-Barrier AlGaIn/GaN Hybrid Anode Diode With Al<sub>2</sub>O<sub>3</sub> Gate Dielectric and *In Situ* Si<sub>3</sub>N<sub>4</sub>-Cap Passivation. *Zhu, L.*, +, *TED Oct. 2020 4136-4140*
- High-Resolution AlGaIn/GaN HEMT-Based Electrochemical Sensor for Biomedical Applications. *Sharma, N.*, +, *TED Jan. 2020 289-295*
- High-Resolution Thermoreflectance Imaging Investigation of Self-Heating in AlGaIn/GaN HEMTs on Si, SiC, and Diamond Substrates. *Helou, A.E.*, +, *TED Dec. 2020 5415-5420*
- Hole-Induced Degradation in E-Mode GaN MIS-FETs: Impact of Substrate Terminations. *Hua, M.*, +, *TED Jan. 2020 217-223*
- Hot-Electron Effects in AlGaIn/GaN HEMTs Under Semi-ON DC Stress. *Minetto, A.*, +, *TED Nov. 2020 4602-4605*
- Hybrid Plasmonic Ring-Resonator Uni-Traveling Carrier Pin-Photodetector on InGaAsP/InP Layer Stack. *Rostami-Khomami, A.*, +, *TED Aug. 2020 3221-3228*
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- Impact of AlInN Back-Barrier Over AlGaIn/GaN MOS-HEMT With HfO<sub>2</sub> Dielectric Using Cubic Spline Interpolation Technique. *Sandeep, V.*, +, *TED Sept. 2020 3558-3563*
- Impact of Film Stress of Field-Plate Dielectric on Electric Characteristics of GaN-HEMTs. *Ando, Y.*, +, *TED Dec. 2020 5421-5426*
- Impact of Relative Gate Position on DC and RF Characteristics of High Performance AlGaIn/GaN HEMTs. *Yadav, Y.K.*, +, *TED Oct. 2020 4141-4146*
- Impact of Residual Carbon on Avalanche Voltage and Stability of Polarization-Induced Vertical GaN p-n Junction. *Fabris, E.*, +, *TED Oct. 2020 3978-3982*
- Improved T<sub>MAX</sub> Estimation in GaN HEMTs Using an Equivalent Hot Point Approximation. *Odabasi, O.*, +, *TED April 2020 1553-1559*
- Improved Design of a Thermophotovoltaic Device. *Liao, T.*, +, *TED Nov. 2020 4709-4712*
- Improved the C-V Curve Shift, Trap State Responsiveness, and Dynamic R<sub>ON</sub> of SBDs by the Composite 2-D-3-D Channel Heterostructure Under the OFF-State Stress. *Yang, L.*, +, *TED Nov. 2020 4808-4812*
- Improvement of AlN Material Quality by High-Temperature Annealing Toward Power Diodes. *Ni, X.*, +, *TED Oct. 2020 3988-3991*
- Improvement of Electron Transport Property and on-Resistance in Normally-OFF Al<sub>2</sub>O<sub>3</sub>/AlGaIn/GaN MOS-HEMTs Using Post-Etch Surface Treatment. *Zhu, J.*, +, *TED Sept. 2020 3541-3547*
- Improvement of the Deep UV Sensor Performance of a β-Ga<sub>2</sub>O<sub>3</sub> Photodiode by Coupling of Two Planar Diodes. *Vieira, D.H.*, +, *TED Nov. 2020 4947-4952*
- Improving Current ON/OFF Ratio and Subthreshold Swing of Schottky-Gate AlGaIn/GaN HEMTs by Postmetallization Annealing. *Lee, H.*, +, *TED July 2020 2760-2764*
- Improving the Efficiency of GaInP/GaAs Light Emitters Using Surface Passivation. *Tripathi, T.S.*, +, *TED Sept. 2020 3667-3672*
- In<sub>2</sub>O<sub>3</sub>/TiO<sub>2</sub> Heterostructure for Highly Responsive Low-Noise Ultraviolet Photodetector. *Moudgil, A.*, +, *TED Jan. 2020 166-172*
- InSb Avalanche Photodiodes on GaAs Substrates for Mid-Infrared Detection. *Alimi, Y.*, +, *TED Jan. 2020 179-184*
- Insight into Buffer Trap-Induced Current Saturation and Current Collapse in GaN RF Heterojunction Field-Effect Transistors. *Tripathi, D.C.*, +, *TED Dec. 2020 5460-5465*
- Integration, BEOL, and Thermal Stress Impact on CMOS-Compatible Titanium-Based Contacts for III-V Devices on a 300-mm Platform. *Boyer, F.*, +, *TED June 2020 2495-2502*
- Introduction of Graphene to Decrease Barrier Height and Improve Contact Characteristics of Metal/Si-GaAs Interface. *Liu, K.*, +, *TED Oct. 2020 4105-4111*
- Investigation of Defect Characteristics and Carrier Transport Mechanisms in GaN Layers With Different Carbon Doping Concentration. *Wang, H.*, +, *TED Nov. 2020 4827-4833*
- Investigation of Electrical Characteristic Behavior Induced by Channel-Release Process in Stacked Nanosheet Gate-All-Around MOSFETs. *Kim, S.*, +, *TED June 2020 2648-2652*
- Investigation of High-Frequency Fine Structure in the Current Output of Shaped Contact Planar Gunn Diodes. *Mindil, A.*, +, *TED May 2020 1946-1951*
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- Investigation of Wide- and Ultrawide-Bandgap Semiconductors From Impact-Ionization Coefficients. *Nouketcha, F.L.L.*, +, *TED Oct. 2020 3999-4005*
- Low-Frequency Noise Investigation of GaN/AlGaIn Metal-Oxide-Semiconductor High-Electron-Mobility Field-Effect Transistor With Different Gate Length and Orientation. *Takakura, K.*, +, *TED Aug. 2020 3062-3068*
- Low-Voltage AlGaAs/GaAs Thyristors as High-Peak-Current Pulse Switches for High-Power Semiconductor Laser Pumping. *Slipchenko, S.O.*, +, *TED Jan. 2020 193-197*
- Machine Learning-Based Statistical Approach to Analyze Process Dependencies on Threshold Voltage in Recessed Gate AlGaIn/GaN MIS-HEMTs. *Wu, T.*, +, *TED Dec. 2020 5448-5453*
- Measuring Thermal Resistance of GaN HEMTs Using Modulation Method. *Smirnov, V.I.*, +, *TED Oct. 2020 4112-4117*
- Modeling and Analysis of Normally-OFF p-GaN Gate AlGaIn/GaN HEMT as an ON-Chip Capacitor. *Abdulsalam, A.*, +, *TED Sept. 2020 3536-3540*
- Modeling Bias Dependence of Self-Heating in GaN HEMTs Using Two Heat Sources. *Chen, X.*, +, *TED Aug. 2020 3082-3087*
- Modeling of Enhancement-Mode GaN-GIT for High-Power and High-Temperature Application. *Shamsir, S.*, +, *TED Feb. 2020 588-594*
- Modeling of Short-Channel Effects in GaN HEMTs. *Allaei, M.*, +, *TED Aug. 2020 3088-3094*
- Modeling of the Vertical Leakage Current in AlN/Si Heterojunctions for GaN Power Applications. *Borga, M.*, +, *TED Feb. 2020 595-599*
- Modeling the Influence of the Acceptor-Type Trap on the 2DEG Density for GaN MIS-HEMTs. *Shi, Y.*, +, *TED June 2020 2290-2296*
- New Room Temperature Ammonia Gas Sensor Synthesized by a Tantalum Pentoxide (Ta<sub>2</sub>O<sub>5</sub>) Dielectric and Catalytic Platinum (Pt) Metals. *Liu, B.*, +, *TED June 2020 2566-2572*
- Novel Drain-Connected Field Plate GaN HEMT Designs for Improved V<sub>BD</sub>-R<sub>ON</sub> Tradeoff and RF PA Performance. *Soni, A.*, +, *TED April 2020 1718-1725*
- Numerical Study of Carrier Transport in n-/n<sub>+</sub>GaAs/AlGaAs Heterostructure at High Current Densities. *Soboleva, O.S.*, +, *TED Feb. 2020 438-443*
- On-Wafer Fast Evaluation of Failure Mechanism of 0.25-μm AlGaIn/GaN HEMTs: Evidence of Sidewall Indiffusion. *Rzin, M.*, +, *TED July 2020 2765-2770*
- Opportunities in Device Scaling for 3-nm Node and Beyond: FinFET Versus GAA-FET Versus UFET. *Das, U.K.*, +, *TED June 2020 2633-2638*
- Optimization of Negative-Capacitance Vertical-Tunnel FET (NCVT-FET). *Hu, V.P.*, +, *TED June 2020 2593-2599*
- Optimization of Ohmic Contact for AlGaIn/GaN HEMT on Low-Resistivity Silicon. *Benakaprasad, B.*, +, *TED March 2020 863-868*
- p-Diamond, Si, GaN, and InGaAs TeraFETs. *Zhang, Y.*, +, *TED Nov. 2020 4858-4865*
- p-i-n High-Speed Photodiodes for X-Ray and Infrared Imagers Fabricated by *In Situ*-Doped APCVD Germanium Homoepitaxy. *Hunt, C.E.*, +, *TED Aug. 2020 3235-3241*
- Parametric Optimum Design and Performance Improvement of a Thermophotonic Cell. *Yang, Z.*, +, *TED June 2020 2376-2380*
- Performance Investigation of Bulk Photoconductive Semiconductor Switch Based on Reversely Biased p<sup>+</sup>-i-n<sup>+</sup> Structure. *Hu, L.*, +, *TED Nov. 2020 4963-4969*
- Quantitative Analysis of High-Pressure Deuterium Annealing Effects on Vertically Stacked Gate-All-Around SONOS Memory. *Yu, J.*, +, *TED Sept. 2020 3903-3907*
- Reliability Concern of 650-V Normally-OFF GaN Devices Under Reverse Freewheeling Stress. *Li, S.*, +, *TED Aug. 2020 3492-3495*
- Room-Temperature Mid-Infrared Detection via Resonant Microwave Circuits. *Dev, S.*, +, *TED April 2020 1632-1638*
- Short-Pulse Properties of the Gunn Diode. *Semyonov, E.V.*, +, *TED May 2020 2100-2105*

- Simulation Study of Single-Event Burnout in GaN MISFET With Schottky Element. *Wang, Y.*, +, *TED Dec. 2020 5466-5471*
- Simulations of Ultralow-Power Nonvolatile Cells for Random-Access Memory. *Lane, D.*, +, *TED Feb. 2020 474-480*
- Single Pulse Charge Pumping Measurements on GaN MOS-HEMTs: Fast and Reliable Extraction of Interface Traps Density. *Alghamdi, S.*, +, *TED Feb. 2020 444-448*
- Study of GaN-Based Light-Emitting Diode (LED) With a Hybrid Surface Structure. *Chen, W.*, +, *TED Nov. 2020 4953-4957*
- Super Field Plate Technique That Can Provide Charge Balance Effect for Lateral Power Devices Without Occupying Drift Region. *Zhang, C.*, +, *TED May 2020 2218-2222*
- Suppression of Surface Leakage Currents in InAs Avalanche Photodiodes via Sputtering of High- $k$  Dielectric Layers. *Cao, Z.*, +, *TED Oct. 2020 4269-4273*
- Surface Potential-Based Analytical Modeling of Electrostatic and Transport Phenomena of GaN Nanowire Junctionless MOSFET. *Khan, M.I.*, +, *TED Sept. 2020 3568-3576*
- Surface-Potential-Based Compact Model for the Gate Current of p-GaN Gate HEMTs. *Wang, J.*, +, *TED Sept. 2020 3564-3567*
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- Ferroelectric HfZrO<sub>2</sub> With Electrode Engineering and Stimulation Schemes as Symmetric Analog Synaptic Weight Element for Deep Neural Network Training. *Hsiang, K.*, +, *TED Oct. 2020 4201-4207*
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- Modeling Field Effect in Black Silicon and Its Impact on Device Performance. *Heinonen, J.*, +, *TED April 2020 1645-1652*
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- Low-Cost, High-Power Jamming Transmitter Based on Magnetron. *Yang, Y.*, +, *TED July 2020 2912-2918*

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- A 4-μm Diameter SPAD Using Less-Doped N-Well Guard Ring in Baseline 65-nm CMOS. *Lu, X.*, +, *TED May 2020 2223-2225*
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- Enhanced Ultraviolet Avalanche Photodiode With 640-nm-Thin Silicon Body Based on SOI Technology. *Alirezaei, I.S.*, +, *TED Nov. 2020 4641-4644*
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- Research on an Overmoded *Ka*-Band RBWO Operating in TM<sub>02</sub> Mode With Low-Guiding Magnetic Field. *Wang, D.*, +, *TED Jan. 2020 314-321*
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- Study on Wideband THz Backward Wave Oscillator Driven by Pseudo-spark-Sourced Sheet Electron Beam. *Zhang, J.*, +, *TED Aug. 2020 3395-3402*
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- Conductance in a Nanoribbon of Topologically Insulating MoS<sub>2</sub> in the 1T' Phase. *Sverdlov, V.*, +, *TED Nov. 2020 4687-4690*
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- Realistic Modeling of MoS<sub>2</sub> Piezoelectric Transistor. *Alidoosty-Shahraki, M.*, +, *TED Aug. 2020 3459-3465*
- Theoretical Analysis of Ballistic Current Transport in Monolayer Black Arsenic MOSFETs. *Seo, J.E.*, +, *TED Feb. 2020 622-626*

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A Low-Voltage, Premodulation Terahertz Oscillator Based on a Carbon Nanotube Cold Cathode. *Xu, X.*, +, *TED March 2020 1266-1269*

Fabrication of Field Emission Device With Lateral-Cathode Triode for Lighting Applications. *Huang, C.*, +, *TED Dec. 2020 5755-5759*

Resistive Analysis of Scattering-Dependent Electrical Transport in Single-Wall Carbon-Nanotube Networks. *Tripathy, S.*, +, *TED Dec. 2020 5676-5684*

Stabilized and Equalized Field-Emission Currents From Carbon Nanotube Emitters by Cascade Active-Current-Control. *Lee, J.*, +, *TED March 2020 1192-1197*

Ultralow- $k$  Dielectric With Structured Pores for Interconnect Delay Reduction. *Xiao, Y.*, +, *TED May 2020 2071-2075*

Wafer-Scale Fabricated On-Chip Thermionic Electron Sources With an Integrated Extraction Gate. *Wang, Y.*, +, *TED Nov. 2020 5132-5137*

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Ambient-Air-Processed Ambipolar Perovskite Phototransistor With High Photodetectivity. *Haque, F.*, +, *TED Aug. 2020 3215-3220*

Amplified Methanol Sensitivity in Reduced Graphene Oxide FET Using Appropriate Gate Electrostatic. *Hazra, A.*, +, *TED Nov. 2020 5111-5118*

Analytical Current-Voltage Model for Double-Gate a-IGZO TFTs With Symmetric Structure for Above Threshold. *Hernandez-Barrrios, Y.*, +, *TED May 2020 1980-1986*

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Design and Simulation of Steep-Slope Silicon Cold Source FETs With Effective Carrier Distribution Model. *Gan, W.*, +, *TED June 2020 2243-2248*

Drain Current Optimization in DIBS-Grown MgZnO/CdZnO HFET. *Khan, M.A.*, +, *TED June 2020 2276-2281*

Effect of Different Metallic Contacts on the Device Performance of a p-n Heterostructure of a Topological Insulator and Silicon (p-Bi<sub>2</sub>Te<sub>3</sub>/n-Si). *Ahmad, F.*, +, *TED Dec. 2020 5388-5395*

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Improved the  $C$ - $V$  Curve Shift, Trap State Responsiveness, and Dynamic  $R_{ON}$  of SBDs by the Composite 2-D-3-D Channel Heterostructure Under the OFF-State Stress. *Yang, L.*, +, *TED Nov. 2020 4808-4812*

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Modeling the Key Material Properties of Germanium for Device Simulation in Cryogenic Environments. *Bradley, L.J.*, +, *TED Oct. 2020 4099-4104*

Numerical Study of Carrier Transport in n<sub>+</sub>/n<sub>+</sub>GaAs/AlGaAs Heterostructure at High Current Densities. *Soboleva, O.S.*, +, *TED Feb. 2020 438-443*  
 Study of Positive-Gate-Bias-Induced Hump Phenomenon in Amorphous Indium-Gallium-Zinc Oxide Thin-Film Transistors. *Shi, X.*, +, *TED April 2020 1606-1612*

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Temperature Dependence of Conductivity Modulation in SiC Bipolar Junction Transistors. *Asada, S.*, +, *TED April 2020 1699-1704*

#### Carrier mean free path

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An ON-Resistance Model for Silicon Carbide Merged p-i-n Schottky (MPS) Diodes. *Du, Q.*, +, *TED Oct. 2020 4033-4039*

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Effects of Interface Traps and Self-Heating on the Performance of GAA GaN Vertical Nanowire MOSFET. *Thingujam, T.*, +, *TED March 2020 816-821*  
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- Hybrid 2D–0D SnS<sub>2</sub> Nanoflakes/CTS QDs-Based Broadband (UV-Visible-NIR) Photodetector. *Yadav, S.M.*, +, *TED May 2020 2008-2015*
- Hydrogen Impacts of PEALD InGaZnO TFTs Using SiO<sub>x</sub> Gate Insulators Deposited by PECVD and PEALD. *Jeong, S.*, +, *TED Oct. 2020 4250-4255*
- Impact of Dummy Gate Removal and a Silicon Cap on the Low-Frequency Noise Performance of Germanium nFinFETs. *Xie, D.*, +, *TED Nov. 2020 4713-4719*
- Impact of Mechanical Stress on 3-D NAND Flash Current Conduction. *Kruv, A.*, +, *TED Nov. 2020 4891-4896*
- Impact of Transport Anisotropy on the Performance of van der Waals Materials-Based Electron Devices. *Cao, W.*, +, *TED March 2020 1310-1316*
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A High Gain Low-Noise Amplifier Based on ITO-Stabilized ZnO Thin-Film Transistors. *Fan, H., +, TED Dec. 2020 5537-5543*

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- On Border Traps in Back-Side-Illuminated CMOS Image Sensor Oxides. *Vici, A.*, +, *TED May 2020 2022-2027*
- Physical Model of Current-Assisted Photonic Demodulator (CAPD) for Time-of-Flight CMOS Image Sensor. *Estrada, C.J.*, +, *TED July 2020 2825-2830*
- Pixel Design Driven Performance Improvement in 4T CMOS Image Sensors: Dark Current Reduction and Full-Well Enhancement. *Brunetti, A.M.*, +, *TED Jan. 2020 409-412*
- CMOS integrated circuits**
- 4H-SiC CMOS Transimpedance Amplifier of Gamma-Irradiation Resistance Over 1 MGy. *Masunaga, M.*, +, *TED Jan. 2020 224-229*
- $J_{\text{SWOF}}$  of 5.5 MA/cm<sup>2</sup> and RA of 5.2- $\Omega \cdot \mu\text{m}^2$  STT-MRAM Technology for LLC Application. *Sakhare, S.*, +, *TED Sept. 2020 3618-3625*
- $V_i$  Extraction Methodologies Influence Process Induced  $V_i$  Variability: Does This Fact Still Hold for Advanced Technology Nodes?. *Bhoir, M.S.*, +, *TED Nov. 2020 4691-4695*
- A 4- $\mu\text{m}$  Diameter SPAD Using Less-Doped N-Well Guard Ring in Baseline 65-nm CMOS. *Lu, X.*, +, *TED May 2020 2223-2225*
- A CMOS-MEMS Thermal-Piezoresistive Oscillator for Mass Sensing Applications. *Zope, A.A.*, +, *TED March 2020 1183-1191*
- A Low-Power CMOS Current Reference for Piezoelectric Energy Harvesters. *Carvalho, R.*, +, *TED Aug. 2020 3403-3410*
- A New Low-Capacitance High-Voltage-Tolerant Protection Clamp for High-Speed Applications. *He, L.*, +, *TED Aug. 2020 3030-3034*
- A Predictive 3-D Source/Drain Resistance Compact Model and the Impact on 7 nm and Scaled FinFETs. *Wu, T.*, +, *TED June 2020 2255-2262*
- Analysis of Gate-Metal Resistance in CMOS-Compatible RF GaN HEMTs. *ElKashlan, R.Y.*, +, *TED Nov. 2020 4592-4596*
- Band-to-Band Tunneling Based Ultra-Energy-Efficient Silicon Neuron. *Chavan, T.*, +, *TED June 2020 2614-2620*
- Buried Power Rail Integration With FinFETs for Ultimate CMOS Scaling. *Gupta, A.*, +, *TED Dec. 2020 5349-5354*
- Compact ESD Protection Design for CMOS Low-Noise Amplifier. *Lin, C.*, +, *TED Jan. 2020 33-39*
- Compact Model of Dzyaloshinskii Domain Wall Motion-Based MTJ for Spin Neural Networks. *Wang, C.*, +, *TED June 2020 2621-2626*
- Demonstration of Tunneling Field-Effect Transistor Ternary Inverter. *Kim, H.W.*, +, *TED Oct. 2020 4541-4544*
- Design and Simulation of Novel Low-Voltage CMOS Vertical Hall Devices With Capacitively Coupled Measuring Contacts. *Okeil, H.*, +, *TED Dec. 2020 5653-5661*
- Design of High-Voltage-Tolerant Power-Rail ESD Protection Circuit for Power Pin of Negative Voltage in Low-Voltage CMOS Processes. *Chang, R.*, +, *TED Jan. 2020 40-46*
- Design Optimization of Photovoltaic Cell Stacking in a Triple-Well CMOS Process. *Hong, G.*, +, *TED June 2020 2381-2385*
- Fabrication of Vertically Stacked Nanosheet Junctionless Field-Effect Transistors and Applications for the CMOS and CFET Inverters. *Sung, P.*, +, *TED Sept. 2020 3504-3509*
- Fully Depleted MAPS in 110-nm CMOS Process With 100–300- $\mu\text{m}$  Active Substrate. *Pancheri, L.*, +, *TED June 2020 2393-2399*
- High-Voltage Drain-Extended FinFET With a High-*k* Dielectric Field Plate. *Kim, H.*, +, *TED March 2020 1077-1084*
- Highly Tunable High- $Q$  Inversion-Mode MOS Varactor in the 1–325-GHz Band. *Margalef-Rovira, M.*, +, *TED June 2020 2263-2269*
- Integration, BEOL, and Thermal Stress Impact on CMOS-Compatible Titanium-Based Contacts for III–V Devices on a 300-mm Platform. *Boyer, F.*, +, *TED June 2020 2495-2502*
- Low-Noise Si-JFETs Enhanced by Split-Channel Concept. *Sturm-Rogon, L.*, +, *TED Nov. 2020 4789-4793*
- MOSFETs' Electrical Performance in the 160-nm BCD Technology Process With the Diamond Layout Shape. *Barri, D.*, +, *TED Aug. 2020 3270-3277*
- On-Chip Fully Integrated Field Emission Arrays for High-Voltage MEMS Applications. *Deka, N.*, +, *TED Sept. 2020 3753-3760*
- On-Wafer FinFET-Based EUV/eBeam Detector Arrays for Advanced Lithography Processes. *Wang, C.*, +, *TED June 2020 2406-2413*
- Process Variation Analysis of Device Performance Using Virtual Fabrication: Methodology Demonstrated on a CMOS 14-nm FinFET Vehicle. *Vincent, B.*, +, *TED Dec. 2020 5374-5380*
- RF/High-Speed I/O ESD Protection: Co-optimizing Strategy Between BEOL Capacitance and HBM Immunity in Advanced CMOS Process. *Wu, W.*, +, *TED July 2020 2752-2759*
- Thermal Stress-Aware CMOS–SRAM Partitioning in Sequential 3-D Technology. *Salahuddin, S.M.*, +, *TED Nov. 2020 4631-4635*
- Vertically Stacked Gate-All-Around Structured Tunneling-Based Ternary-CMOS. *Kim, S.*, +, *TED Sept. 2020 3889-3893*
- CMOS logic circuits**
- 3-D NAND Technology Achievements and Future Scaling Perspectives. *Goda, A.*, *TED April 2020 1373-1381*
- A Vertical Combo Spacer to Optimize Electrothermal Characteristics of 7-nm Nanosheet Gate-All-Around Transistor. *Liu, R.*, +, *TED June 2020 2249-2254*
- Ambient Temperature-Induced Device Self-Heating Effects on Multi-Fin Si CMOS Logic Circuit Performance in N-14 to N-7 Scaled Technologies. *Venkateswarlu, S.*, +, *TED April 2020 1530-1536*
- Design of Fin-Diode-Triggered Rotated Silicon-Controlled Rectifier for High-Speed Digital Application in 16-nm FinFET Process. *Chang, R.*, +, *TED July 2020 2725-2731*
- Improved Air Spacer for Highly Scaled CMOS Technology. *Cheng, K.*, +, *TED Dec. 2020 5355-5361*
- Memory-Logic Hybrid Gate With 3-D Stackable Complementary Latches. *Lee, C.*, +, *TED Aug. 2020 3109-3114*
- Prospects for Wide Bandgap and Ultrawide Bandgap CMOS Devices. *Bader, S.J.*, +, *TED Oct. 2020 4010-4020*
- Scaling Trends of Monolithic 3-D Complementary Metal–Oxide–Semiconductor Nanoelectromechanical Reconfigurable Logic Circuits. *Ko, J.W.*, +, *TED Sept. 2020 3861-3867*
- Vertically Stacked Gate-All-Around Structured Tunneling-Based Ternary-CMOS. *Kim, S.*, +, *TED Sept. 2020 3889-3893*

**CMOS memory circuits**

- $J_{\text{SW}} \text{ of } 5.5 \text{ MA/cm}^2 \text{ and RA of } 5.2\text{-}\Omega \cdot \mu\text{m}^2 \text{ STT-MRAM Technology for LLC Application. Sakhare, S., +, TED Sept. 2020 3618-3625}$
- An Improved RRAM-Based Binarized Neural Network With High Variation-Tolerated Forward/Backward Propagation Module. Zhang, Y., +, TED Feb. 2020 469-473
- An Ultracompact Switching-Voltage-Based Fully Reconfigurable RRAM PUF With Low Native Instability. Zhao, X., +, TED July 2020 3010-3013
- Development of 2T-SONOS Cell Using a Contamination-Free Process Integration for a Highly Reliable Code Storage eNVM. Park, S., +, TED March 2020 922-928
- FeCAM: A Universal Compact Digital and Analog Content Addressable Memory Using Ferroelectric. Yin, X., +, TED July 2020 2785-2792
- High-Throughput In-Memory Computing for Binary Deep Neural Networks With Monolithically Integrated RRAM and 90-nm CMOS. Yin, S., +, TED Oct. 2020 4185-4192
- In-Memory Digital Comparator Based on a Single Multivalued One-Transistor-One-Resistor Memristor. Cheng, L., +, TED March 2020 1293-1296
- Lightweight Integrated Design of PUF and TRNG Security Primitives Based on eFlash Memory in 55-nm CMOS. Larimian, S., +, TED April 2020 1586-1592
- Magnetic Nonvolatile SRAM Based on Voltage-Gated Spin-Orbit-Torque Magnetic Tunnel Junctions. Wang, C., +, TED May 2020 1965-1971
- Memory-Logic Hybrid Gate With 3-D Stackable Complementary Latches. Lee, C., +, TED Aug. 2020 3109-3114
- Non-Volatile Field-Effect Transistors Enabled by Oxygen Vacancy-Related Dipoles for Memory and Synapse Applications. Peng, Y., +, TED Sept. 2020 3632-3636
- Self-Activation Neural Network Based on Self-Selective Memory Device With Rectified Multilevel States. Wang, Z., +, TED Oct. 2020 4166-4171

**Coatings**

- Ammonia Sensing Characteristics of a Platinum (Pt) Hybrid Structure/GaN-Based Schottky Diode. Chang, C., +, TED Jan. 2020 296-303

**Coaxial cables**

- Improved Mode Selection in Coaxial Cavities for Subterahertz Second-Harmonic Gyrotrons. Shcherbinin, V.I., +, TED July 2020 2933-2939

**Coaxial waveguides**

- Numerical Computation of Resonant Frequency and Field Distribution Based on S-Parameters in the Open Coaxial Resonator. Chen, S., +, TED Oct. 2020 4437-4441
- Suppression of the Higher-Order Azimuthal Mode Competition in an X-Band Triaxial Klystron Amplifier With a Slotted Coaxial Waveguide. Zhang, J., +, TED March 2020 1215-1220

**Cobalt**

- Investigation of Barrier Property of Amorphous Co-Ti Layer as Single Barrier/Liner in Local Co Interconnects. Zhang, D., +, TED May 2020 2076-2081

**Cobalt alloys**

- Low-Current-Density Magnetic Tunnel Junctions for STT-RAM Application Using  $\text{MgO}_x \text{N}_{1-x} (x = 0.57)$  Tunnel Barrier. Moinuddin, M.G., +, TED Jan. 2020 125-132
- Scalability of Quad Interface p-MTJ for 1X nm STT-MRAM With 10-ns Low Power Write Operation, 10 Years Retention and Endurance  $> 10^{11}$ . Miura, S., +, TED Dec. 2020 5368-5373

**Cold-cathode tubes**

- A Low-Voltage, Premodulation Terahertz Oscillator Based on a Carbon Nanotube Cold Cathode. Xu, X., +, TED March 2020 1266-1269

**Color**

- Corrections to "Opportunities in Device Scaling for 3-nm Node and Beyond: FinFET Versus GAA-FET Versus UFET". Das, U.K., +, TED Aug. 2020 3496

**Color displays**

- Synthesis of Silica-Coated  $\text{Cs}_4\text{PbBr}_6$  and  $\text{Cs}_4\text{Pb}(\text{Br}_{0.4}\text{I}_{0.6})_6$  Quantum Dots With Long Lifetime and Enhancement in Quantum Efficiency for WLEDs Applications: Lightings With High CRI and Displays With Wide Color Gamut. Lin, Y., +, TED June 2020 2386-2392

**Combinatorial mathematics**

- Antiferroelectric Tunnel Junctions as Energy-Efficient Coupled Oscillators: Modeling, Analysis, and Application to Solving Combinatorial Optimization Problems. Andrawis, R., +, TED July 2020 2974-2980

**Comparators (circuits)**

- In-Memory Digital Comparator Based on a Single Multivalued One-Transistor-One-Resistor Memristor. Cheng, L., +, TED March 2020 1293-1296

**Compensation**

- A Low-Power CMOS Current Reference for Piezoelectric Energy Harvesters. Carvalho, R., +, TED Aug. 2020 3403-3410

**Composite material interfaces**

- Introduction of Graphene to Decrease Barrier Height and Improve Contact Characteristics of Metal/SI-GaAs Interface. Liu, K., +, TED Oct. 2020 4105-4111

**Composite materials**

- Graphene Oxide Wrapped Hollow  $\text{SnO}_2$  Sphere for Room Temperature Formaldehyde Sensing: An Insight Through Computational Analysis & Experimental Study. Manna, B., +, TED Sept. 2020 3767-3774

**Compressive strength**

- High-Performance Flexible Resistive RAM With PVP:GO Composite and Ultrathin  $\text{HfO}_x$  Hybrid Bilayer. Varun, I., +, TED March 2020 949-954
- Ultralow Current Switching in Flexible Hybrid PVP:MoS<sub>2</sub>/HfO<sub>x</sub> Bilayer Devices. Varun, I., +, TED Aug. 2020 3472-3477

**Computational complexity**

- Time Complexity of In-Memory Solution of Linear Systems. Sun, Z., +, TED July 2020 2945-2951

**Computer centers**

- Magnetoassistive Random Access Memory: Present and Future. Ikegawa, S., +, TED April 2020 1407-1419

**Computer graphic equipment**

- Multiple-GPU-Based Simulation of Ka-Band Helix Traveling Wave Tube. Wang, X., +, TED June 2020 2585-2592

**Computerized instrumentation**

- Analysis of High-Frequency Measurement of Transistors Along With Electromagnetic and SPICE Cosimulation. Fregonese, S., +, TED Nov. 2020 4770-4776
- Numerical Modeling of Glucose Biosensor With pH-Based Electrochemical Field-Effect Transistor Device. Ba, M., +, TED April 2020 1787-1792
- Study of a Palladium (Pd)/Aluminum-Doped Zinc Oxide (AZO) Hydrogen Sensor and the Kalman Algorithm for Internet-of-Things (IoT) Application. Chen, W., +, TED Oct. 2020 4405-4412

**Computerized numerical control**

- Wideband Rectangular TE<sub>10</sub> to TE<sub>n0</sub> Mode Converters for Terahertz-Band High-Order Overmoded Planar Slow-Wave Structures. Shu, G., +, TED March 2020 1259-1265

**Conducting polymers**

- High-Performance Inverted Structure Broadband Photodetector Based on ZnO Nanorods/PCDTBT:PCBM:PbS QDs. Upadhyay, D.C., +, TED Nov. 2020 4970-4976

**Conduction bands**

- A Comprehensive Analysis of the 2-DEG Transport Properties in  $\text{In}_x\text{Al}_{1-x}\text{N}/\text{AlN}/\text{GaN}$  Heterostructure: Experiments and Numerical Simulations. Qin, J., +, TED Dec. 2020 5427-5433
- Band Alignment and Interface Recombination in NiO/ $\beta$ -Ga<sub>2</sub>O<sub>3</sub> Type-II p-n Heterojunctions. Gong, H., +, TED Aug. 2020 3341-3347
- Charge-Based Compact Drain Current Modeling of InAs-OI-Si MOSFET Including Subband Energies and Band Nonparabolicity. Maity, S.K., +, TED June 2020 2282-2289
- Design and Fabrication of Vertical Metal/TiO<sub>2</sub>/ $\beta$ -Ga<sub>2</sub>O<sub>3</sub> Dielectric Heterojunction Diode With Reverse Blocking Voltage of 1010 V. Hu, Z., +, TED Dec. 2020 5628-5632
- Dilute Oxygen Alloys of ZnS as a Promising Toxic-Free Buffer Layer for Cu(In, Ga)Se<sub>2</sub> Thin-Film Solar Cells. Alqahtani, S.M., +, TED April 2020 1666-1673
- Effect of Uniaxial Tensile Strains at Different Orientations on the Characteristics of AlGaIn/GaN High-Electron-Mobility Transistors. Wang, C., +, TED Feb. 2020 449-454



- Experimental Determination of Impact Ionization Coefficients Along  $\langle 1120 \rangle$  in 4H-SiC. *Stefanakis, D.*, +, *TED Sept. 2020 3740-3744*
- Forward Conduction Instability of Quasi-Vertical GaN p-i-n Diodes on Si Substrates. *Zhang, Y.*, +, *TED Oct. 2020 3992-3998*
- Ge–GaAs–Ge Heterojunction MOSFETs for Mixed-Signal Applications. *Mech, B.C.*, +, *TED Sept. 2020 3585-3591*
- Highly Stable, Nanocrystalline, ZnO Thin-Film Transistor by Spray Pyrolysis Using High- $K$  Dielectric. *Saha, J.K.*, +, *TED March 2020 1021-1026*
- How Can Si/Ge Core/Shell Nanowires Outperform Their Pure Material Counterparts?. *Ly, Y.*, +, *TED March 2020 1327-1333*
- Low-Frequency Noise Spectroscopy Characterization of HgCdTe Infrared Detectors. *Zhu, L.*, +, *TED Feb. 2020 547-551*
- Neuro-Inspired-in-Memory Computing Using Charge-Trapping MemTransistor on Germanium as Synaptic Device. *Chou, Y.*, +, *TED Sept. 2020 3605-3609*
- Numerical Study of Carrier Transport in n<sub>+</sub>/n/n<sub>+</sub>GaAs/AlGaAs Heterostructure at High Current Densities. *Soboleva, O.S.*, +, *TED Feb. 2020 438-443*
- Operation Characteristics of Gate-All-Around Junctionless Flash Memory Devices With Si<sub>3</sub>N<sub>4</sub>/ZrO-Based Stacked Trapping Layer. *Fang, H.*, +, *TED Sept. 2020 3626-3631*
- Trapping and Detrapping Mechanisms in  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> Vertical FinFETs Investigated by Electro-Optical Measurements. *Fabris, E.*, +, *TED Oct. 2020 3954-3959*
- Ultrahigh-Speed Mid-Infrared Photodetectors With 2-D Electron Gas in a CdTe/PbTe Heterojunction. *Zhu, J.*, +, *TED June 2020 2432-2436*
- Contact angle**
- Characterizations of Electrolyte–Insulator–Semiconductor Sensors With Array Wells and a Stack-Sensing Membrane. *Chen, H.J.H.*, +, *TED Sept. 2020 3761-3766*
- Interface Engineering With Polystyrene for High-Performance, Low-Voltage Driven Organic Thin Film Transistor. *Hasan, M.M.*, +, *TED April 2020 1751-1756*
- Contact potential**
- Effects of Contact Potential and Sidewall Surface Plane on the Performance of GaN Vertical Nanowire MOSFETs for Low-Voltage Operation. *Son, D.*, +, *TED April 2020 1547-1552*
- Contact resistance**
- A Ladder Transmission Line Model for the Extraction of Ultralow Specific Contact Resistivity—Part II: Experimental Verification. *Xu, H.*, +, *TED July 2020 2690-2696*
- A Physics-Based Compact Model for Ultrathin Black Phosphorus FETs—Part I: Effect of Contacts, Temperature, Ambipolarity, and Traps. *Yar-moghaddam, E.*, +, *TED Jan. 2020 389-396*
- A Physics-Based Compact Model for Ultrathin Black Phosphorus FETs—Part II: Model Validation Against Numerical and Experimental Data. *Yar-moghaddam, E.*, +, *TED Jan. 2020 397-405*
- A Predictive 3-D Source/Drain Resistance Compact Model and the Impact on 7 nm and Scaled FinFETs. *Wu, T.*, +, *TED June 2020 2255-2262*
- Alcohol-Based Sulfur Treatment for Improved Performance and Yield in Local Back-Gated and Channel-Length-Scaled MoS<sub>2</sub> FETs. *Sanjay, S.*, +, *TED Sept. 2020 3711-3715*
- Ambient Temperature-Induced Device Self-Heating Effects on Multi-Fin Si CMOS Logic Circuit Performance in N-14 to N-7 Scaled Technologies. *Venkateswarlu, S.*, +, *TED April 2020 1530-1536*
- Analyzing the Effects of Aluminum-Doped ZnO and Ag Layers for the Transparent Electrode Vertical PCSS. *Zheng, Z.*, +, *TED June 2020 2414-2417*
- Buried Power Rail Integration With FinFETs for Ultimate CMOS Scaling. *Gupta, A.*, +, *TED Dec. 2020 5349-5354*
- Causes of the Difference Between Hall Mobility and Field-Effect Mobility for p-Type RF Sputtered Cu<sub>2</sub>O Thin-Film Transistors. *Jo, J.*, +, *TED Dec. 2020 5557-5563*
- Chalcogen-Assisted Enhanced Atomic Orbital Interaction at TMD–Metal Interface and Sulfur Passivation for Overall Performance Boost of 2-D TMD FETs. *Ansh, .*, +, *TED Feb. 2020 717-724*
- Drain Current Optimization in DIBS-Grown MgZnO/CdZnO HFET. *Khan, M.A.*, +, *TED June 2020 2276-2281*
- Fabrication and Performance of Ti/Al/Ni/TiN Au-Free Ohmic Contacts for Undoped AlGaIn/GaN HEMT. *Li, X.*, +, *TED May 2020 1959-1964*
- Gate-Length Dependence of Vertical GaSb Nanowire p-MOSFETs on Si. *Jonsson, A.*, +, *TED Oct. 2020 4118-4122*
- Impact of Gate Size on Abnormal Current Rise Under an Electric Field in Organic Thin-Film Transistors. *Chen, H.*, +, *TED March 2020 1143-1148*
- Integration, BEOL, and Thermal Stress Impact on CMOS-Compatible Titanium-Based Contacts for III–V Devices on a 300-mm Platform. *Boyer, F.*, +, *TED June 2020 2495-2502*
- Introduction of Graphene to Decrease Barrier Height and Improve Contact Characteristics of Metal/Si-GaAs Interface. *Liu, K.*, +, *TED Oct. 2020 4105-4111*
- Investigation of Barrier Property of Amorphous Co–Ti Layer as Single Barrier/Liner in Local Co Interconnects. *Zhang, D.*, +, *TED May 2020 2076-2081*
- Investigation of Switching Time in GaN/AlN Resonant Tunneling Diodes by Experiments and P-SPICE Models. *Zhang, W.*, +, *TED Jan. 2020 75-79*
- Investigation of Ultrathin Ni Germanosilicide for Advanced pMOS Contact Metallization. *Mao, S.*, +, *TED Nov. 2020 5039-5044*
- On the Accuracy of the Cox–Strack Equation and Method for Contact Resistivity Determination. *van Rijnbach, M.*, +, *TED April 2020 1757-1763*
- Optimization of Ohmic Contact for AlGaIn/GaN HEMT on Low-Resistivity Silicon. *Benakaprasad, B.*, +, *TED March 2020 863-868*
- Refractory W Ohmic Contacts to H-Terminated Diamond. *Vardi, A.*, +, *TED Sept. 2020 3516-3521*
- Specific Contact Resistivity Improvement by As Preamorphization Implantation for Ti-Based Ohmic Contacts on n+–Si. *Mao, S.*, +, *TED April 2020 1726-1729*
- The Demonstration of Carbon Nanotubes (CNTs) as Flip-Chip Connections in 3-D Integrated Circuits With an Ultralow Connection Resistance. *Liao, M.*, +, *TED May 2020 2205-2207*
- Thermoelectric Property Requirements for On-Chip Cooling of Device Transients. *Nimmagadda, L.A.*, +, *TED Sept. 2020 3716-3721*
- Content-addressable storage**
- FeCAM: A Universal Compact Digital and Analog Content Addressable Memory Using Ferroelectric. *Yin, X.*, +, *TED July 2020 2785-2792*
- Convolutional neural nets**
- Efficient and Robust Spike-Driven Deep Convolutional Neural Networks Based on NOR Flash Computing Array. *Xiang, Y.*, +, *TED June 2020 2329-2335*
- Investigation of Read Disturb and Bipolar Read Scheme on Multilevel RRAM-Based Deep Learning Inference Engine. *Shim, W.*, +, *TED June 2020 2318-2323*
- Strategies to Improve the Accuracy of Memristor-Based Convolutional Neural Networks. *Pan, W.*, +, *TED March 2020 895-901*
- Cooling**
- Accurate Temperature Estimation for Each Gate of GaN HEMT With n-Gate Fingers. *Al-Saman, A.A.*, +, *TED Sept. 2020 3577-3584*
- Compact Thermal Modeling of Color LEDs—A Comparative Study. *Janicki, M.*, +, *TED Aug. 2020 3186-3190*
- Enhancement of Hot Spot Cooling by Capped Diamond Layer Deposition for Multifinger AlGaIn/GaN HEMTs. *Zhang, H.*, +, *TED Jan. 2020 47-52*
- Heat Dissipation Enhancement of Phosphor-Converted White Laser Diodes by Thermally Self-Managing Phosphor-in-Glass. *Peng, Y.*, +, *TED Oct. 2020 4288-4292*
- High-Average-Power Second Harmonic  $W$ -Band Gyrotron With Room-Temperature Solenoid. *Pilosoff, M.*, +, *TED April 2020 1804-1807*
- Optimization of Stacked Nanoplate FET for 3-nm Node. *Kim, H.*, +, *TED April 2020 1537-1541*
- Suppression of Surface Leakage Currents in InAs Avalanche Photodiodes via Sputtering of High- $k$  Dielectric Layers. *Cao, Z.*, +, *TED Oct. 2020 4269-4273*
- Copper**
- Effect of Thermal Management on the Performance of VCSELs. *Pan, P.*, +, *TED Sept. 2020 3736-3739*
- Copper compounds**
- Amorphous p-Type CuNiSnO Thin-Film Transistors Processed at Low Temperatures. *Cheng, X.*, +, *TED June 2020 2336-2341*

- Annealing Effect on the Performance of Copper Oxide Resistive Memory Devices. *Hsu, C.*, +, *TED March 2020 976-983*
- Causes of the Difference Between Hall Mobility and Field-Effect Mobility for p-Type RF Sputtered Cu<sub>2</sub>O Thin-Film Transistors. *Jo, J.*, +, *TED Dec. 2020 5557-5563*
- Dilute Oxygen Alloys of ZnS as a Promising Toxic-Free Buffer Layer for Cu(In, Ga)Se<sub>2</sub> Thin-Film Solar Cells. *Alqahtani, S.M.*, +, *TED April 2020 1666-1673*
- Efficient Resistive Switching and Spike Rate Dependent Plasticity in a New CuCrO<sub>2</sub> Memristor for Plausible Neuromorphic Systems. *Boppidi, P.K.R.*, +, *TED Aug. 2020 3451-3458*
- Elucidation of Inhomogeneous Heterojunction Performance of Al/Cu<sub>3</sub>FeS<sub>4</sub> Schottky Diode With a Gaussian Distribution of Barrier Heights. *Sil, S.*, +, *TED May 2020 2082-2087*
- Hybrid 2D-0D SnS<sub>2</sub> Nanoflakes/CTS QDs-Based Broadband (UV-Visible-NIR) Photodetector. *Yadav, S.M.*, +, *TED May 2020 2008-2015*
- Lateral Photocurrent-Induced High-Performance Self-Powered Photodetector Observed in CIGS Heterojunction. *Zhang, Z.*, +, *TED April 2020 1639-1644*
- Copy protection**
- Flash Watermark: An Anticounterfeiting Technique for NAND Flash Memories. *Sakib, S.*, +, *TED Oct. 2020 4172-4177*
- Lightweight Integrated Design of PUF and TRNG Security Primitives Based on eFlash Memory in 55-nm CMOS. *Larimian, S.*, +, *TED April 2020 1586-1592*
- Correlation methods**
- Correlation Between Anode Area and Sensitivity for the TiN/GaN Schottky Barrier Diode Temperature Sensor. *Li, X.*, +, *TED March 2020 1171-1175*
- Corrosion**
- A Lifetime Performance Analysis of LED Luminaires Under Real-Operation Profiles. *Padmasali, A.N.*, +, *TED Jan. 2020 146-153*
- Coupled circuits**
- Antiferroelectric Tunnel Junctions as Energy-Efficient Coupled Oscillators: Modeling, Analysis, and Application to Solving Combinatorial Optimization Problems. *Andrews, R.*, +, *TED July 2020 2974-2980*
- Covariance matrices**
- Time Complexity of In-Memory Solution of Linear Systems. *Sun, Z.*, +, *TED July 2020 2945-2951*
- Cryogenic electronics**
- A High-Gain CMOS Operational Amplifier Using Low-Temperature Poly-Si Oxide TFTs. *Rahaman, A.*, +, *TED Feb. 2020 524-528*
- Cryogenic Operation of Thin-Film FDSOI nMOS Transistors: The Effect of Back Bias on Drain Current and Transconductance. *Casse, M.*, +, *TED Nov. 2020 4636-4640*
- Low-Noise Si-JFETs Enhanced by Split-Channel Concept. *Sturm-Rogon, L.*, +, *TED Nov. 2020 4789-4793*
- Modeling the Key Material Properties of Germanium for Device Simulation in Cryogenic Environments. *Bradley, L.J.*, +, *TED Oct. 2020 4099-4104*
- Performance and Low-Frequency Noise of 22-nm FDSOI Down to 4.2 K for Cryogenic Applications. *Cardoso Paz, B.*, +, *TED Nov. 2020 4563-4567*
- Cryogenics**
- Inflection Phenomenon in Cryogenic MOSFET Behavior. *Beckers, A.*, +, *TED March 2020 1357-1360*
- Cryptography**
- Lightweight Integrated Design of PUF and TRNG Security Primitives Based on eFlash Memory in 55-nm CMOS. *Larimian, S.*, +, *TED April 2020 1586-1592*
- Thermal Brownian Motion of Skyrmion for True Random Number Generation. *Yao, Y.*, +, *TED June 2020 2553-2558*
- Crystal defects**
- Characterization of Schottky Barrier Diodes on Heteroepitaxial Diamond on 3C-SiC/Si Substrates. *Murooka, T.*, +, *TED Jan. 2020 212-216*
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- Effect of Different Metallic Contacts on the Device Performance of a p-n Heterostructure of a Topological Insulator and Silicon (p-Bi<sub>2</sub>Te<sub>3</sub>/n-Si). *Ahmad, F.*, +, *TED Dec. 2020 5388-5395*
- Influence of the Surface Tungsten Distribution on the Emission Properties of Barium Tungsten Cathode. *Shang, J.*, +, *TED June 2020 2580-2584*
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Insertion of HfO<sub>2</sub> Seed/Dielectric Layer to the Ferroelectric HZO Films for Heightened Remanent Polarization in MFM Capacitors. *Gaddam, V.*, +, *TED Feb. 2020 745-750*

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#### Electron-hole recombination

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#### Electronic design automation

A Four-Port Model of Light-Emitting Transistors for Circuit Simulation and Application. *Yang, L.*, +, *TED Dec. 2020 5572-5580*

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**Electronic engineering computing**

A Monolithic 3-D Integration of RRAM Array and Oxide Semiconductor FET for In-Memory Computing in 3-D Neural Network. *Wu, J.*, +, *TED Dec. 2020 5322-5328*

Consistent Surface-Potential-Based Modeling of Drain and Gate Currents in AlGaIn/GaN HEMTs. *Albahrani, S.A.*, +, *TED Feb. 2020 455-462*

Drain-Erase Scheme in Ferroelectric Field Effect Transistor—Part II: 3-D-NAND Architecture for In-Memory Computing. *Wang, P.*, +, *TED March 2020 962-967*

Machine Learning-Based Statistical Approach to Analyze Process Dependencies on Threshold Voltage in Recessed Gate AlGaIn/GaN MIS-HEMTs. *Wu, T.*, +, *TED Dec. 2020 5448-5453*

Speed Up Quantum Transport Device Simulation on Ferroelectric Tunnel Junction With Machine Learning Methods. *Wu, T.*, +, *TED Nov. 2020 5229-5235*

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Design and Development of a Double-Bridge Micromirror With Bending and Twisting Cantilevers for Multiobject Spectroscopy. *Kumar, A.*, +, *TED Oct. 2020 4392-4398*

Effect of Thermal Management on the Performance of VCSELs. *Pan, P.*, +, *TED Sept. 2020 3736-3739*

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A New SCR Structure With High Holding Voltage and Low ON-Resistance for 5-V Applications. *Do, K.-I.*, +, *TED March 2020 1052-1058*

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An Improved Silicon-Controlled Rectifier (SCR) for Low-Voltage ESD Application. *Du, F.*, +, *TED Feb. 2020 576-581*

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Compact ESD Protection Design for CMOS Low-Noise Amplifier. *Lin, C.*, +, *TED Jan. 2020 33-39*

Degradation Behavior and Mechanisms of E-Mode GaN HEMTs With p-GaN Gate Under Reverse Electrostatic Discharge Stress. *Chen, Y.Q.*, +, *TED Feb. 2020 566-570*

Design of Fin-Diode-Triggered Rotated Silicon-Controlled Rectifier for High-Speed Digital Application in 16-nm FinFET Process. *Chang, R.*, +, *TED July 2020 2725-2731*

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Gallium Nitride and Silicon Transistors on 300 mm Silicon Wafers Enabled by 3-D Monolithic Heterogeneous Integration. *Then, H.W.*, +, *TED Dec. 2020 5306-5314*

On-Chip Over-Voltage Protection Design Against Surge Events on the CC Pin of USB Type-C Interface. *Ke, C.*, +, *TED July 2020 2702-2709*

Physical Insights Into the ESD Behavior of Drain Extended FinFETs (DeFinFETs) and Unique Current Filament Dynamics. *Kumar, B.S.*, +, *TED July 2020 2717-2724*

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Stacking Switch to Achieve Low-Trigger and High-Holding-Voltage-Clamp Characteristics. *He, L.*, +, *TED April 2020 1506-1510*

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A Physics-Based Compact Model for Ultrathin Black Phosphorus FETs—Part I: Effect of Contacts, Temperature, Ambipolarity, and Traps. *Yar-moghaddam, E.*, +, *TED Jan. 2020 389-396*

Hall Effect Measurements in Rotating Magnetic Field on Sub-30-nm Silicon Nanowires Fabricated by a Top-Down Approach. *Verma, A.*, +, *TED Nov. 2020 5201-5208*

N<sup>+</sup> Pocket-Doped Vertical TFET for Enhanced Sensitivity in Biosensing Applications: Modeling and Simulation. *Devi, W.V.*, +, *TED May 2020 2133-2139*

Physically Consistent Method for Calculating Trap-Assisted-Tunneling Current Applied to Line Tunneling Field-Effect Transistor. *Najam, F.*, +, *TED May 2020 2106-2112*

Surface Potential-Based Analytical Modeling of Electrostatic and Transport Phenomena of GaN Nanowire Junctionless MOSFET. *Khan, M.I.*, +, *TED Sept. 2020 3568-3576*

Systematic Modeling of Electrostatics, Transport, and Statistical Variability Effects of Interface Traps in End-of-the-Roadmap III-V MOSFETs. *Zagni, N.*, +, *TED April 2020 1560-1566*

**Elemental semiconductors**

A CMOS-MEMS Thermal-Piezoresistive Oscillator for Mass Sensing Applications. *Zope, A.A.*, +, *TED March 2020 1183-1191*

A Physical-Based Analytical Model for the Kink Current of Polycrystalline Silicon TFTs. *Chen, Y.*, +, *TED June 2020 2359-2364*

A Study on the Temperature-Dependent Operation of Fluorite-Structure-Based Ferroelectric HfO<sub>2</sub> Memory FeFET: Pyroelectricity and Reliability. *Ali, T.*, +, *TED July 2020 2981-2987*

Accumulation-Mode Device: New Power MOSFET Breaking Superjunction Silicon Limit by Simulation Study. *Duan, B.*, +, *TED March 2020 1085-1089*

Ambient Temperature-Induced Device Self-Heating Effects on Multi-Fin Si CMOS Logic Circuit Performance in N-14 to N-7 Scaled Technologies. *Venkateswarlu, S.*, +, *TED April 2020 1530-1536*

Ambient-Air-Processed Ambipolar Perovskite Phototransistor With High Photodetectivity. *Haque, F.*, +, *TED Aug. 2020 3215-3220*

Analysis of High-Frequency Measurement of Transistors Along With Electromagnetic and SPICE Cosimulation. *Fregonese, S.*, +, *TED Nov. 2020 4770-4776*

Analytical Modeling of Short-Channel Effects in MFIS Negative-Capacitance FET Including Quantum Confinement Effects. *Pandey, N.*, +, *TED Nov. 2020 4757-4764*

Assessing the Performance of Novel Two-Dimensional Materials Transistors: First-Principles Based Approach. *Kim, B.*, +, *TED Feb. 2020 463-468*

Characterization of Schottky Barrier Diodes on Heteroepitaxial Diamond on 3C-SiC/Si Substrates. *Murooka, T.*, +, *TED Jan. 2020 212-216*

Charge-Based Compact Drain Current Modeling of InAs-OI-Si MOSFET Including Subband Energies and Band Nonparabolicity. *Maity, S.K.*, +, *TED June 2020 2282-2289*



- Comparison of Dark Current Random Telegraph Signals in Silicon and InSb-Based Photodetector Pixel Arrays. *Durnez, C.*, +, *TED Nov. 2020 4940-4946*
- Controlling the Effective Channel Thickness of Junctionless Transistors by Substrate Bias. *Jeon, D.*, +, *TED Nov. 2020 4736-4740*
- Corrections to "Optimization and Scaling of Ge-Pocket TFET" [Dec 18 5289-5294]. *Li, W.*, *TED March 2020 1361*
- Design and Simulation of Steep-Slope Silicon Cold Source FETs With Effective Carrier Distribution Model. *Gan, W.*, +, *TED June 2020 2243-2248*
- Design Considerations for Si- and Ge-Stacked Nanosheet pMOSFETs Based on Quantum Transport Simulations. *Zhang, S.*, +, *TED Jan. 2020 26-32*
- Design Principles for a Novel Lightweight Configurable PUF Using a Reconfigurable FET. *Rajan, C.*, +, *TED Dec. 2020 5797-5803*
- Diameter Scaling of Vertical Ge Gate- All-Around Nanowire pMOSFETs. *Liu, M.*, +, *TED July 2020 2988-2994*
- Diameter-Dependent Piezoresistive Sensing Performance of Junctionless Gate-All-Around Nanowire FET. *Rana, V.*, +, *TED July 2020 2884-2889*
- Diamond Field-Effect Transistors With  $V_2O_5$ -Induced Transfer Doping: Scaling to 50-nm Gate Length. *Crawford, K.G.*, +, *TED June 2020 2270-2275*
- Direct-Bandgap Electroluminescence From Germanium With Subband Engineering Utilizing a Metal-Oxide-Semiconductor Structure. *Xie, M.*, +, *TED May 2020 2016-2021*
- Double-Gate Junctionless 1T DRAM With Physical Barriers for Retention Improvement. *Ansari, M.H.R.*, +, *TED April 2020 1471-1479*
- Effect of Different Metallic Contacts on the Device Performance of a p-n Heterostructure of a Topological Insulator and Silicon (p-Bi<sub>2</sub>Te<sub>3</sub>/n-Si). *Ahmad, F.*, +, *TED Dec. 2020 5388-5395*
- Effect of ELA Energy Density on Self-Heating Stress in Low-Temperature Polycrystalline Silicon Thin-Film Transistors. *Huang, S.*, +, *TED Aug. 2020 3163-3166*
- Effect of Seed Layer on Gate-All-Around Poly-Si Nanowire Negative-Capacitance FETs With MFMIS and MFIS Structures: Planar Capacitors to 3-D FETs. *Lee, S.*, +, *TED Feb. 2020 711-716*
- Effects of Annealing on the Behavior of Sn in GeSn Alloy and GeSn-Based Photodetectors. *Wang, L.*, +, *TED Aug. 2020 3229-3234*
- Enhanced Ultraviolet Avalanche Photodiode With 640-nm-Thin Silicon Body Based on SOI Technology. *Alirezaei, I.S.*, +, *TED Nov. 2020 4641-4644*
- Experimental Characterization of Charge Trapping Dynamics in 100-nm AlN/GaN/AlGaIn-on-Si HEMTs by Wideband Transient Measurements. *Angelotti, A.M.*, +, *TED Aug. 2020 3069-3074*
- Exploration of Negative Capacitance in Gate-All-Around Si Nanosheet Transistors. *Sakib, F.I.*, +, *TED Nov. 2020 5236-5242*
- Extended-Source Double-Gate Tunnel FET With Improved DC and Analog/RF Performance. *Joshi, T.*, +, *TED April 2020 1873-1879*
- Gallium Nitride and Silicon Transistors on 300 mm Silicon Wafers Enabled by 3-D Monolithic Heterogeneous Integration. *Then, H.W.*, +, *TED Dec. 2020 5306-5314*
- Gate-Length Dependence of Vertical GaSb Nanowire p-MOSFETs on Si. *Jonsson, A.*, +, *TED Oct. 2020 4118-4122*
- Ge-GaAs-Ge Heterojunction MOSFETs for Mixed-Signal Applications. *Mech, B.C.*, +, *TED Sept. 2020 3585-3591*
- Hall Effect Measurements in Rotating Magnetic Field on Sub-30-nm Silicon Nanowires Fabricated by a Top-Down Approach. *Verma, A.*, +, *TED Nov. 2020 5201-5208*
- High-Performance Normally-OFF AlGaIn/GaN Fin-MISHEMT on Silicon With Low Work Function Metal-Source Contact Ledge. *Huang, Y.*, +, *TED Dec. 2020 5434-5440*
- Highly Sensitive Narrowband Si Photodetector With Peak Response at Around 1060 nm. *Wang, L.*, +, *TED Aug. 2020 3211-3214*
- Highly Sensitive p<sup>+</sup>Si/Al Thermopile-Based Gas Flow Sensors by Using Front-Sided Bulk Micromachining Technology. *Wang, S.*, +, *TED April 2020 1781-1786*
- How Can Si/Ge Core/Shell Nanowires Outperform Their Pure Material Counterparts?. *Lv, Y.*, +, *TED March 2020 1327-1333*
- Hybrid 2D-0D SnS<sub>2</sub> Nanoflakes/CTS QDs-Based Broadband (UV-Visible-NIR) Photodetector. *Yadav, S.M.*, +, *TED May 2020 2008-2015*
- Impact of Charges at Ferroelectric/Interlayer Interface on Depolarization Field of Ferroelectric FET With Metal/Ferroelectric/Interlayer/Si Gate-Stack. *Wang, X.*, +, *TED Oct. 2020 4500-4506*
- Impact of Dummy Gate Removal and a Silicon Cap on the Low-Frequency Noise Performance of Germanium nFinFETs. *Xie, D.*, +, *TED Nov. 2020 4713-4719*
- Impact of Mechanical Stress on 3-D NAND Flash Current Conduction. *Kruv, A.*, +, *TED Nov. 2020 4891-4896*
- Impact of N<sub>2</sub> Coimplant on Phosphorus Diffusion and Activation for n<sup>+</sup>/p Ge Junctions. *Dev, S.*, +, *TED Feb. 2020 419-423*
- Impact of Width Scaling and Parasitic Series Resistance on the Performance of Silicene Nanoribbon MOSFETs. *Poljak, M.*, *TED Nov. 2020 4705-4708*
- Impacts of Stress Voltage and Channel Length on Hot-Carrier Characteristics of Tunnel Field-Effect Thin-Film Transistor. *Ma, W.C.*, +, *TED Nov. 2020 5243-5246*
- Implementation and Characterization of an Integrate-and-Fire Neuron Circuit Using a Silicon Nanowire Feedback Field-Effect Transistor. *Woo, S.*, +, *TED July 2020 2995-3000*
- Improved Low-Voltage Sensing Performance in MIS(p) Tunnel Diodes by Oxide Thickening at the Gate Fringe. *Lin, K.*, +, *TED April 2020 1845-1851*
- Improved the *C-V* Curve Shift, Trap State Responsiveness, and Dynamic *R<sub>ON</sub>* of SBDs by the Composite 2-D-3-D Channel Heterostructure Under the OFF-State Stress. *Yang, L.*, +, *TED Nov. 2020 4808-4812*
- Inadequacy of Third-Order Elastic Coefficients for Predicting Nonlinearity in Highly n-Type-Doped Silicon Resonators. *Khazaeili, B.*, +, *TED Feb. 2020 614-621*
- Influence of Different Surface Morphologies on the Performance of High-Voltage, Low-Resistance Diamond Schottky Diodes. *Reinke, P.*, +, *TED June 2020 2471-2477*
- Influence of Metal Gate Electrodes on Electrical Properties of Atomic-Layer-Deposited Al-Rich HfAlO/Ga<sub>2</sub>O<sub>3</sub> MOSCAPs. *Zhang, H.*, +, *TED April 2020 1730-1736*
- Influence of Substrate Resistivity on Porous Silicon Small-Signal RF Properties. *Godet, G.*, +, *TED Nov. 2020 4654-4657*
- Integration, BEOL, and Thermal Stress Impact on CMOS-Compatible Titanium-Based Contacts for III-V Devices on a 300-mm Platform. *Boyer, F.*, +, *TED June 2020 2495-2502*
- Intrinsic Capabilities for Digital Switching of Silicene Nanoribbons With Edge Defects. *Poljak, M.*, *TED Jan. 2020 354-359*
- Introduction of Graphene to Decrease Barrier Height and Improve Contact Characteristics of Metal/Si-GaAs Interface. *Liu, K.*, +, *TED Oct. 2020 4105-4111*
- Investigation of Defect Characteristics and Carrier Transport Mechanisms in GaN Layers With Different Carbon Doping Concentration. *Wang, H.*, +, *TED Nov. 2020 4827-4833*
- Investigation of Electrical Characteristic Behavior Induced by Channel-Release Process in Stacked Nanosheet Gate-All-Around MOSFETs. *Kim, S.*, +, *TED June 2020 2648-2652*
- Investigation of Self-Heating Effects in Vacuum Gate Dielectric Gate-all-Around Vertically Stacked Silicon Nanowire Field Effect Transistors. *Su, Y.*, +, *TED Oct. 2020 4085-4091*
- Investigation of the Temperature Dependence of Hot-Carrier Degradation in Si MOSFETs Using Spectroscopic Charge Pumping. *Ruch, B.*, +, *TED Oct. 2020 4092-4098*
- Investigation on the Effect of Gate Dielectric and Other Device Parameters on Digital Performance of Silicene Nanoribbon Tunnel FET. *Singh, N.K.*, +, *TED July 2020 2966-2973*
- Low Contact Resistivity to Ge Using *In-Situ* B and Sn Incorporation by Chemical Vapor Deposition. *Tsai, C.*, +, *TED Nov. 2020 5053-5058*
- Low-Frequency Noise Assessment of Vertically Stacked Si n-Channel Nanosheet FETs With Different Metal Gates. *Oliveira, A.*, +, *TED Nov. 2020 4802-4807*
- Low-Frequency Noise Characteristics Under the OFF-State Stress. *Lee, G.*, +, *TED Oct. 2020 4366-4371*

- Low-Frequency Noise Characterization of Germanium n-Channel FinFETs. *de Oliveira, A.V.*, +, *TED July 2020 2872-2877*
- Low-Noise Si-JFETs Enhanced by Split-Channel Concept. *Sturm-Rogon, L.*, +, *TED Nov. 2020 4789-4793*
- Modeling Field Effect in Black Silicon and Its Impact on Device Performance. *Heinonen, J.*, +, *TED April 2020 1645-1652*
- Modeling of the Vertical Leakage Current in AlN/Si Heterojunctions for GaN Power Applications. *Borga, M.*, +, *TED Feb. 2020 595-599*
- Modeling the Key Material Properties of Germanium for Device Simulation in Cryogenic Environments. *Bradley, L.J.*, +, *TED Oct. 2020 4099-4104*
- Nanofabricated Low-Voltage Gated Si Field-Ionization Arrays. *Rughoobur, G.*, +, *TED Aug. 2020 3378-3384*
- Neuro-Inspired-in-Memory Computing Using Charge-Trapping MemTransistor on Germanium as Synaptic Device. *Chou, Y.*, +, *TED Sept. 2020 3605-3609*
- Non-Volatile Field-Effect Transistors Enabled by Oxygen Vacancy-Related Dipoles for Memory and Synapse Applications. *Peng, Y.*, +, *TED Sept. 2020 3632-3636*
- Numerical Simulation of Thermal Conductivity of SiNW-SiGe<sub>0.3</sub> Composite for Thermoelectric Applications. *Lee, M.*, +, *TED May 2020 2088-2092*
- On Border Traps in Back-Side-Illuminated CMOS Image Sensor Oxides. *Vici, A.*, +, *TED May 2020 2022-2027*
- On the Stability of Amorphous Silicon Temperature Sensors. *Lovecchio, N.*, +, *TED Aug. 2020 3348-3354*
- On-Chip Fully Integrated Field Emission Arrays for High-Voltage MEMS Applications. *Deka, N.*, +, *TED Sept. 2020 3753-3760*
- Operation Characteristics of Gate-All-Around Junctionless Flash Memory Devices With Si<sub>3</sub>N<sub>4</sub>/ZrO-Based Stacked Trapping Layer. *Fang, H.*, +, *TED Sept. 2020 3626-3631*
- Optical Pixel Sensor Based on a-Si:H TFTs to Detect Combined Optical Signals for Multiuser Interactive Displays. *Lin, C.*, +, *TED June 2020 2425-2431*
- Optimization of Ohmic Contact for AlGaIn/GaN HEMT on Low-Resistivity Silicon. *Benakaprasad, B.*, +, *TED March 2020 863-868*
- Optimized Design of Carrier Injection Terminal for Reliable Low-Temperature Poly-Si TFTs Under Dynamic Hot-Carrier Stress. *Chen, L.*, +, *TED May 2020 1987-1992*
- Optimized Substrate for Improved Performance of Stacked Nanosheet Field-Effect Transistor. *Jegatheesan, V.*, +, *TED Oct. 2020 4079-4084*
- p-Diamond, Si, GaN, and InGaAs TeraFETs. *Zhang, Y.*, +, *TED Nov. 2020 4858-4865*
- p-i-n High-Speed Photodiodes for X-Ray and Infrared Imagers Fabricated by *In Situ*-Doped APCVD Germanium Homoepitaxy. *Hunt, C.E.*, +, *TED Aug. 2020 3235-3241*
- Passivation of n- and p-Type Silicon Surfaces With Spray-Coated Sol-Gel Silicon Oxide Thin Film. *Bhajibale, J.*, +, *TED Nov. 2020 5045-5052*
- Performance Evaluation and Device Physics Investigation of Negative-Capacitance MOSFETs Based on Ultrathin Body Silicon and Monolayer MoS<sub>2</sub>. *Luo, S.*, +, *TED Aug. 2020 3049-3055*
- Poly-Si Finlike Thin-Film Transistors With Various Wide Drain Designs for Radio Frequency and 3-D Integrated Circuits. *Hu, H.*, +, *TED June 2020 2342-2345*
- Process Variation Analysis of Device Performance Using Virtual Fabrication: Methodology Demonstrated on a CMOS 14-nm FinFET Vehicle. *Vincent, B.*, +, *TED Dec. 2020 5374-5380*
- Prospects for Wide Bandgap and Ultrawide Bandgap CMOS Devices. *Bader, S.J.*, +, *TED Oct. 2020 4010-4020*
- Quantitative Analysis of High-Pressure Deuterium Annealing Effects on Vertically Stacked Gate-All-Around SONOS Memory. *Yu, J.*, +, *TED Sept. 2020 3903-3907*
- Room Temperature Hydrogen Sensing Investigation of Zinc Oxide Schottky Thin-Film Transistors: Dependence on Film Thickness. *Ghosh, S.*, +, *TED Dec. 2020 5701-5709*
- Si Nanowire With Integrated Space-Charge-Limited Conducted Schottky Junction for Enhancing Field Electron Emission and Its Gated Devices. *Zeng, M.*, +, *TED Oct. 2020 4467-4472*
- Single Pulse Charge Pumping Measurements on GaN MOS-HEMTs: Fast and Reliable Extraction of Interface Traps Density. *Alghamdi, S.*, +, *TED Feb. 2020 444-448*
- Size-Dependent Photoresponse of Germanium Nanocrystals-Metal Oxide Semiconductor Photodetector. *Dhyani, V.*, +, *TED Feb. 2020 558-565*
- Study on Degradation Mechanisms of Thermal Conductivity for Confined Nanochannel in Gate-All-Around Silicon Nanowire Field-Effect Transistors. *Lai, J.*, +, *TED Oct. 2020 4060-4066*
- Study on Various Device Structures for Steep-Switching Silicon-on-Insulator Feedback Field-Effect Transistors. *Lee, C.*, +, *TED April 2020 1852-1858*
- Suppression of Edge Effect Induced by Positive Gate Bias Stress in Low-Temperature Polycrystalline Silicon TFTs With Channel Width Extension Over Source/Drain Regions. *Wang, Y.*, +, *TED Dec. 2020 5552-5556*
- Sustained Benefits of NCFETs Under Extreme Scaling to the End of the IRDS. *Cam, T.*, +, *TED Sept. 2020 3843-3851*
- TCAD Study of VLD Termination in Large-Area Power Devices Featuring a DLC Passivation. *Balestra, L.*, +, *TED Nov. 2020 4645-4648*
- Temperature Dependence of Analog Performance, Linearity, and Harmonic Distortion for a Ge-Source Tunnel FET. *Datta, E.*, +, *TED March 2020 810-815*
- Theoretical Analysis of Ballistic Current Transport in Monolayer Black Arsenic MOSFETs. *Seo, J.E.*, +, *TED Feb. 2020 622-626*
- Thermoelectric Property Requirements for On-Chip Cooling of Device Transients. *Nimmagadda, L.A.*, +, *TED Sept. 2020 3716-3721*
- Transformable Junctionless Transistor (T-JLT). *Han, J.*, +, *TED June 2020 2639-2644*
- Transport Mechanism of B/P Codoped Armchair Graphene Nanoribbons. *Liu, J.*, +, *TED May 2020 2120-2125*
- Variability Effects in Nanowire and Macaroni MOSFETs—Part I: Random Dopant Fluctuations. *Spinelli, A.S.*, +, *TED April 2020 1485-1491*
- Vertically Stacked Gate-All-Around Structured Tunneling-Based Ternary-CMOS. *Kim, S.*, +, *TED Sept. 2020 3889-3893*
- Wafer-Scale Fabricated On-Chip Thermionic Electron Sources With an Integrated Extraction Gate. *Wang, Y.*, +, *TED Nov. 2020 5132-5137*
- Wafer-Scale Si-GaN Monolithic Integrated E-Mode Cascode FET Realized by Transfer Printing and Self-Aligned Etching Technology. *Zhang, J.*, +, *TED Aug. 2020 3304-3308*
- Ellipsometers**
- Deposition of c-Axis Aligned Crystalline InGaZnO by Mist Atmospheric Pressure Chemical Vapor Deposition for Thin-Film Transistor Applications. *Liu, H.*, +, *TED Oct. 2020 4245-4249*
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- MgZnO-Based Schottky Barrier Ultraviolet-B Photodiode by Ultrasonic Spray Pyrolysis Deposition. *Liu, H.*, +, *TED Jan. 2020 173-178*
- Phase-Sensitive Pulse Sensor Using 2-D Active Plasmonics on Conformal Substrates. *Sohrabi, F.*, +, *TED Oct. 2020 4379-4384*
- Embedded systems**
- Development of 2T-SONOS Cell Using a Contamination-Free Process Integration for a Highly Reliable Code Storage eNVM. *Park, S.*, +, *TED March 2020 922-928*
- Encapsulation**
- A Simple Method to Realize Millilens Array on Encapsulant Layer for Enhancing Light Efficiency of COB-LEDs. *Yu, X.*, +, *TED Sept. 2020 3655-3659*
- Buried Power Rail Integration With FinFETs for Ultimate CMOS Scaling. *Gupta, A.*, +, *TED Dec. 2020 5349-5354*
- Encapsulated X-Ray Detector Enabled by All-Inorganic Lead-Free Perovskite Film With High Sensitivity and Low Detection Limit. *Zhang, H.*, +, *TED Aug. 2020 3191-3198*
- Enhancing Luminous Efficiency of Quantum Dot-Based Chip-on-Board Light-Emitting Diodes Using Polystyrene Fiber Mats. *Liang, G.*, +, *TED Oct. 2020 4530-4533*
- Matrix-Addressed Flexible Capacitive Pressure Sensor With Suppressed Crosstalk for Artificial Electronic Skin. *Chen, S.*, +, *TED July 2020 2940-2944*

Ring Remote Phosphor Structure for Laser-Driven White Lighting. *Chen, B.*, +, *TED June 2020 2400-2405*

#### Energy conservation

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**Fission reactor instrumentation**

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Theoretical Study of a  $W$ -Band-Covering Frequency-Tunable Gyrotron. *Li, F.*, +, *TED Feb. 2020 659-666*

**Laser materials processing**

PDMS-Based Microfluidic Glucose Biofuel Cell Integrated With Optimized Laser-Induced Flexible Graphene Bioelectrodes. *Rewatkar, P.*, +, *TED April 2020 1832-1838*

**Laser mode locking**

Extended Feedback System for Coupled Sub-THz Gyro-Devices to Provide New Regimes of Operation. *Marek, A.*, +, *TED Dec. 2020 5729-5735*

**Laser modes**

Stable in-Phase Mode Operation in Coherent VCSEL Array With an Integrated Phase Shifter. *Xun, M.*, +, *TED July 2020 2819-2824*

Theoretical Study of a  $W$ -Band-Covering Frequency-Tunable Gyrotron. *Li, F.*, +, *TED Feb. 2020 659-666*

**Laser sintering**

High-Temperature Thermoelectric Energy Conversion Devices Using Si-Ge Thick Films Prepared by Laser Sintering of Nano/Micro Particles. *Xie, K.*, +, *TED May 2020 2113-2119*

**Lead compounds**

High-Performance Inverted Structure Broadband Photodetector Based on ZnO Nanorods/PCDTBT:PCBM:PbS QDs. *Upadhyay, D.C.*, +, *TED Nov. 2020 4970-4976*

Negative/Positive Electrocaloric Effect in Single-Layer  $Pb(Zr_xTi_{1-x})O_3$  Thin Films for Solid-State Cooling Device. *Prasad Bag, S.*, +, *TED April 2020 1769-1775*

Programming-Pulse Dependence of Ferroelectric Partial Polarization: Insights From a Comparative Study of PZT and HZO Capacitors. *Pandey, P.*, +, *TED Oct. 2020 4482-4487*

Ultrahigh-Speed Mid-Infrared Photodetectors With 2-D Electron Gas in a CdTe/PbTe Heterojunction. *Zhu, J.*, +, *TED June 2020 2432-2436*

**Leakage currents**

4H-SiC CMOS Transimpedance Amplifier of Gamma-Irradiation Resistance Over 1 MGy. *Masunaga, M.*, +, *TED Jan. 2020 224-229*

A Junctionless Accumulation Mode NC-FinFET Gate Underlap Design for Improved Stability and Self-Heating Reduction. *Kumar, M.*, +, *TED Aug. 2020 3424-3430*

A Stochastic Framework for the Time Kinetics of Interface and Bulk Oxide Traps for BTI, SILC, and TDDB in MOSFETs. *Kumar, S.*, +, *TED Nov. 2020 4741-4748*

Analysis of High-Temperature Carrier Transport Mechanisms for High Al-Content  $Al_{0.6}Ga_{0.4}N$  MSM Photodetectors. *Gu, Y.*, +, *TED Jan. 2020 160-165*

Analysis of Metal Work-Function Modulation Effect in Reconfigurable Field-Effect Transistor. *Li, X.*, +, *TED Sept. 2020 3745-3752*

Band Alignment and Interface Recombination in NiO/ $\beta$ -Ga<sub>2</sub>O<sub>3</sub> Type-II p-n Heterojunctions. *Gong, H.*, +, *TED Aug. 2020 3341-3347*

Characterization of Schottky Barrier Diodes on Heteroepitaxial Diamond on 3C-SiC/Si Substrates. *Murooka, T.*, +, *TED Jan. 2020 212-216*

Charge Transport in Vertical GaN Schottky Barrier Diodes: A Refined Physical Model for Conductive Dislocations. *Chen, L.*, +, *TED March 2020 841-846*

Charge-Based Compact Model of Gate Leakage Current for AlInN/GaN and AlGaIn/GaN HEMTs. *Debnath, A.*, +, *TED March 2020 834-840*

CMOS-Like Logic Circuits With Unipolar Thin-Film Transistors on Flexible Substrate. *Li, Q.*, +, *TED Feb. 2020 512-517*

Consistent Surface-Potential-Based Modeling of Drain and Gate Currents in AlGaIn/GaN HEMTs. *Albahrani, S.A.*, +, *TED Feb. 2020 455-462*

Corrections to "Electronic Conduction Mechanisms in Insulators". *Wager, J.F.*, *TED Oct. 2020 4547*

Deep Gate Field Penetration Au:ZrO<sub>2</sub> Metal-Insulator Tunneling Transistor. *McDermott, A.J.*, +, *TED June 2020 2627-2632*

Degradation Mechanism of Ge N<sup>+</sup>-P Shallow Junction With Thin GeSn Surface Layer. *Tsui, B.*, +, *TED March 2020 1120-1125*

Deposition of c-Axis Aligned Crystalline InGaZnO by Mist Atmospheric Pressure Chemical Vapor Deposition for Thin-Film Transistor Applications. *Liu, H.*, +, *TED Oct. 2020 4245-4249*

Design and Fabrication of Vertical GaN p-n Diode With Step-Etched Triple-Zone Junction Termination Extension. *Lee, H.*, +, *TED Sept. 2020 3553-3557*

Design and Optimization of Triple-k Spacer Structure in Two-Stack Nanosheet FET From OFF-State Leakage Perspective. *Ryu, D.*, +, *TED March 2020 1317-1322*

Design Guidelines and Performance Tradeoffs in Recessed AlGaIn/GaN Schottky Barrier Diodes. *Soni, A.*, +, *TED Nov. 2020 4834-4841*

Design of Fin-Diode-Triggered Rotated Silicon-Controlled Rectifier for High-Speed Digital Application in 16-nm FinFET Process. *Chang, R.*, +, *TED July 2020 2725-2731*

Design of High-Voltage-Tolerant Power-Rail ESD Protection Circuit for Power Pin of Negative Voltage in Low-Voltage CMOS Processes. *Chang, R.*, +, *TED Jan. 2020 40-46*

Design Strategies for Mesa-Type GaN-Based Schottky Barrier Diodes for Obtaining High Breakdown Voltage and Low Leakage Current. *Jia, X.*, +, *TED May 2020 1931-1938*

Eco-Friendly Fully Water-Driven HfGdO<sub>x</sub> Gate Dielectrics and Its Application in Thin-Film Transistors and Logic Circuits. *Zhang, C.*, +, *TED March 2020 1001-1008*

Effects of the Molecular Chain Length of Polyimide on the Characteristics of Organic Resistive Random Access Memories. *Wu, C.*, +, *TED Jan. 2020 277-282*

Electrical Properties of Al<sub>2</sub>O<sub>3</sub>/ZnO Metal-Insulator-Semiconductor Capacitors. *Zhang, Q.*, +, *TED Nov. 2020 5033-5038*

Engineering a Unified Dielectric Solution for AlGaIn/GaN MOS-HFET Gate and Access Regions. *Azam, F.*, +, *TED March 2020 881-887*

Enhanced Performance of HgCdTe Midwavelength Infrared Electron Avalanche Photodetectors With Guard Ring Designs. *Li, Q.*, +, *TED Feb. 2020 542-546*

Enhanced Ultraviolet Avalanche Photodiode With 640-nm-Thin Silicon Body Based on SOI Technology. *Alirezaei, I.S.*, +, *TED Nov. 2020 4641-4644*

Experimental Study of  $1/f^{1+\alpha}$  Noise in Transient Leakage Current of Metal-Insulator-Metal With Stacked High-k Polycrystalline Films. *Lin, H.*, +, *TED June 2020 2503-2509*

Gate Leakage Suppression and Breakdown Voltage Enhancement in p-GaN HEMTs Using Metal/Graphene Gates. *Zhou, G.*, +, *TED March 2020 875-880*

- Gate-Induced Drain Leakage in Negative Capacitance FinFETs. *Gaidhane, A.D.*, +, *TED March 2020 802-809*
- Guiding Principles for Trench Schottky Barrier Diodes Based on Ultrawide Bandgap Semiconductors: A Case Study in Ga<sub>2</sub>O<sub>3</sub>. *Li, W.*, +, *TED Oct. 2020 3938-3947*
- High-Performance Ultrathin-Barrier AlGaIn/GaN Hybrid Anode Diode With Al<sub>2</sub>O<sub>3</sub> Gate Dielectric and *In Situ* Si<sub>3</sub>N<sub>4</sub>-Cap Passivation. *Zhu, L.*, +, *TED Oct. 2020 4136-4140*
- Impact of AlGaIn/GaN Interface and Passivation on the Robustness of Low-Noise Amplifiers. *Huang, T.*, +, *TED June 2020 2297-2303*
- Impact of Electrical Stress on Defect Generation in Thin GeO<sub>2</sub>/Ge Gate Stacks Fabricated by Thermal Oxidation. *Yuan, S.*, +, *TED June 2020 2516-2521*
- Impact of Film Stress of Field-Plate Dielectric on Electric Characteristics of GaN-HEMTs. *Ando, Y.*, +, *TED Dec. 2020 5421-5426*
- Impact of Residual Carbon on Avalanche Voltage and Stability of Polarization-Induced Vertical GaN p-n Junction. *Fabris, E.*, +, *TED Oct. 2020 3978-3982*
- Impact of Switching Voltage on Complementary Steep-Slope Tunnel Field Effect Transistor Circuits. *Kato, K.*, +, *TED Sept. 2020 3876-3882*
- Improved TDDDB Reliability and Interface States in 5-nm Hf<sub>0.5</sub>Zr<sub>0.5</sub>O<sub>2</sub> Ferroelectric Technologies Using NH<sub>3</sub> Plasma and Microwave Annealing. *Chen, Y.*, +, *TED April 2020 1581-1585*
- Improvement of Electron Transport Property and on-Resistance in Normally-OFF Al<sub>2</sub>O<sub>3</sub>/AlGaIn/GaN MOS-HEMTs Using Post-Etch Surface Treatment. *Zhu, J.*, +, *TED Sept. 2020 3541-3547*
- Improving Current ON/OFF Ratio and Subthreshold Swing of Schottky-Gate AlGaIn/GaN HEMTs by Postmetallization Annealing. *Lee, H.*, +, *TED July 2020 2760-2764*
- Influence of Metal Gate Electrodes on Electrical Properties of Atomic-Layer-Deposited Al-Rich HfAlO/Ga<sub>2</sub>O<sub>3</sub> MOSCAPs. *Zhang, H.*, +, *TED April 2020 1730-1736*
- Investigating the Failure Mechanism of Short-Circuit Tests in 1.2-kV SiC JBS-Integrated MOSFETs. *Zhang, Y.*, +, *TED Oct. 2020 4027-4032*
- Investigation of HCD- and NBTI-Induced Ultralow Electric Field GIDL in 14-nm Technology Node FinFETs. *Ciou, F.*, +, *TED July 2020 2697-2701*
- Investigation of Sidewall High-*k* Interfacial Layer Effect in Gate-All-Around Structure. *Ryu, D.*, +, *TED April 2020 1859-1863*
- Modeling of the Vertical Leakage Current in AlN/Si Heterojunctions for GaN Power Applications. *Borga, M.*, +, *TED Feb. 2020 595-599*
- Novel Reconfigurable Field-Effect Transistor With Asymmetric Spacer Engineering at Drain Side. *Yao, Y.*, +, *TED Feb. 2020 751-757*
- Optimized Substrate for Improved Performance of Stacked Nanosheet Field-Effect Transistor. *Jegadheesan, V.*, +, *TED Oct. 2020 4079-4084*
- Passivation of n- and p-Type Silicon Surfaces With Spray-Coated Sol-Gel Silicon Oxide Thin Film. *Bhajibale, J.*, +, *TED Nov. 2020 5045-5052*
- Prolonged Transient Behavior of Ultrathin Oxide MIS-Tunneling Diode Induced by Deep Depletion of Surrounded Coupling Electrode. *Hsu, T.*, +, *TED Aug. 2020 3411-3416*
- Reliability Concern of 650-V Normally-OFF GaN Devices Under Reverse Freewheeling Stress. *Li, S.*, +, *TED Aug. 2020 3492-3495*
- Simulation Study on the Optimization and Scaling Behavior of LDMOS Transistors for Low-Voltage Power Applications. *Saadat, A.*, +, *TED Nov. 2020 4990-4997*
- Suppression of Surface Leakage Currents in InAs Avalanche Photodiodes via Sputtering of High-*k* Dielectric Layers. *Cao, Z.*, +, *TED Oct. 2020 4269-4273*
- Surface-Potential-Based Compact Model for the Gate Current of p-GaN Gate HEMTs. *Wang, J.*, +, *TED Sept. 2020 3564-3567*
- Suspended Nanoscale Field Emitter Devices for High-Temperature Operation. *De Rose, L.B.*, +, *TED Nov. 2020 5125-5131*
- Temperature Dependence of Ferroelectricity in Al-Doped HfO<sub>2</sub> Featuring a High *P<sub>r</sub>* of 23.7 μC/cm<sup>2</sup>. *Zhou, J.*, +, *TED Dec. 2020 5633-5638*
- The Impact of a Single Displacement Defect on Tunneling Field-Effect Transistors. *Kim, J.*, +, *TED Nov. 2020 4765-4769*
- The Investigation for Thickness-Dependent Electrical Performance on BaTiO<sub>3</sub>/BiFeO<sub>3</sub> Bilayer Ferromagnetic Capacitors. *Lien, C.*, +, *TED Aug. 2020 3417-3423*
- Tri-Gated Hybrid Anode AlGaIn/GaN Power Diode With Intrinsic Low Turn-on Voltage and Ultralow Reverse Leakage Current. *Zhou, Q.*, +, *TED April 2020 1712-1717*
- Tunneling Current in 4H-SiC p-n Junction Diodes. *Kaneko, M.*, +, *TED Aug. 2020 3329-3334*
- Ultralow Current Switching in Flexible Hybrid PVP:MoS<sub>2</sub>/HfO<sub>x</sub> Bilayer Devices. *Varun, I.*, +, *TED Aug. 2020 3472-3477*
- Learning (artificial intelligence)**
- A Compact Model for Stochastic Spike-Timing-Dependent Plasticity (STDP) Based on Resistive Switching Memory (RRAM) Synapses. *Bianchi, S.*, +, *TED July 2020 2800-2806*
- All-Spin Bayesian Neural Networks. *Yang, K.*, +, *TED March 2020 1340-1347*
- Band-to-Band Tunneling Based Ultra-Energy-Efficient Silicon Neuron. *Chavan, T.*, +, *TED June 2020 2614-2620*
- Bidirectional Analog Conductance Modulation for RRAM-Based Neural Networks. *Jiang, Z.*, +, *TED Nov. 2020 4904-4910*
- Efficient and Robust Spike-Driven Deep Convolutional Neural Networks Based on NOR Flash Computing Array. *Xiang, Y.*, +, *TED June 2020 2329-2335*
- Investigation of Read Disturb and Bipolar Read Scheme on Multilevel RRAM-Based Deep Learning Inference Engine. *Shim, W.*, +, *TED June 2020 2318-2323*
- Lightweight Integrated Design of PUF and TRNG Security Primitives Based on eFlash Memory in 55-nm CMOS. *Larimian, S.*, +, *TED April 2020 1586-1592*
- Machine Learning-Based Statistical Approach to Analyze Process Dependencies on Threshold Voltage in Recessed Gate AlGaIn/GaN MIS-HEMTs. *Wu, T.*, +, *TED Dec. 2020 5448-5453*
- Modeling and Demonstration of Oxygen Vacancy-Based RRAM as Probabilistic Device for Sequence Learning. *Doevenspeck, J.*, +, *TED Feb. 2020 505-511*
- ReRAM: History, Status, and Future. *Chen, Y.*, *TED April 2020 1420-1433*
- Speed Up Quantum Transport Device Simulation on Ferroelectric Tunnel Junction With Machine Learning Methods. *Wu, T.*, +, *TED Nov. 2020 5229-5235*
- Strategies to Improve the Accuracy of Memristor-Based Convolutional Neural Networks. *Pan, W.*, +, *TED March 2020 895-901*
- Variability-Aware Machine Learning Strategy for 3-D NAND Flash Memories. *Ko, K.*, +, *TED April 2020 1575-1580*
- Least squares approximations**
- Exploiting Error Characteristic to Optimize Read Voltage for 3-D NAND Flash Memory. *Zhang, M.*, +, *TED Dec. 2020 5490-5496*
- LED displays**
- Atomized Scan Method for High-Definition Silicon-Based OLED Microdisplays. *Chen, W.*, +, *TED Oct. 2020 4293-4299*
- Fabrication of Field Emission Device With Lateral-Cathode Triode for Lighting Applications. *Huang, C.*, +, *TED Dec. 2020 5755-5759*
- Synthesis of Silica-Coated Cs<sub>4</sub>PbBr<sub>6</sub> and Cs<sub>4</sub>Pb(Br<sub>0.4</sub>I<sub>0.6</sub>)<sub>6</sub> Quantum Dots With Long Lifetime and Enhancement in Quantum Efficiency for WLEDs Applications: Lightings With High CRI and Displays With Wide Color Gamut. *Lin, Y.*, +, *TED June 2020 2386-2392*
- LED lamps**
- A Generalized Methodology for Predicting the Lifetime Performance of LED Luminaire. *Padmasali, A.N.*, +, *TED July 2020 2831-2836*
- A Lifetime Performance Analysis of LED Luminaires Under Real-Operation Profiles. *Padmasali, A.N.*, +, *TED Jan. 2020 146-153*
- Lenses**
- Ring Remote Phosphor Structure for Laser-Driven White Lighting. *Chen, B.*, +, *TED June 2020 2400-2405*
- Life testing**
- A Generalized Methodology for Predicting the Lifetime Performance of LED Luminaire. *Padmasali, A.N.*, +, *TED July 2020 2831-2836*

**LIGA**

Study of a 0.35 THz Extended Interaction Oscillator Driven by a Pseudo-spark-Sourced Sheet Electron Beam. *Xie, J.*, +, *TED Feb. 2020 652-658*

**Light absorption**

Enhancing Luminous Efficiency of Quantum Dot-Based Chip-on-Board Light-Emitting Diodes Using Polystyrene Fiber Mats. *Liang, G.*, +, *TED Oct. 2020 4530-4533*

Size-Dependent Photoresponse of Germanium Nanocrystals-Metal Oxide Semiconductor Photodetector. *Dhyani, V.*, +, *TED Feb. 2020 558-565*

**Light coherence**

Stable in-Phase Mode Operation in Coherent VCSEL Array With an Integrated Phase Shifter. *Xun, M.*, +, *TED July 2020 2819-2824*

**Light emitting diodes**

A Simple Method to Realize Millilens Array on Encapsulant Layer for Enhancing Light Efficiency of COB-LEDs. *Yu, X.*, +, *TED Sept. 2020 3655-3659*

Compact Thermal Modeling of Color LEDs—A Comparative Study. *Janicki, M.*, +, *TED Aug. 2020 3186-3190*

Current Spreading in Back-Contacted GaInP/GaAs Light-Emitting Diodes. *Myllynen, A.*, +, *TED March 2020 1027-1033*

Direct-Bandgap Electroluminescence From Germanium With Subband Engineering Utilizing a Metal-Oxide-Semiconductor Structure. *Xie, M.*, +, *TED May 2020 2016-2021*

Efficiency Droop Suppression and Light Output Power Enhancement of Deep Ultraviolet Light-Emitting Diode by Incorporating Inverted-V-Shaped Quantum Barriers. *Kang, Y.*, +, *TED Nov. 2020 4958-4962*

Efficient Carrier Transport for AlGaIn-Based Deep-UV LEDs With Graded Superlattice p-AlGaIn. *Mondal, R.K.*, +, *TED April 2020 1674-1679*

Enhanced Heat Dissipation of Phosphor Film in WLEDs by AlN-Coated Sapphire Plate. *Zheng, Z.*, +, *TED Aug. 2020 3180-3185*

Enhancing Luminous Efficiency of Quantum Dot-Based Chip-on-Board Light-Emitting Diodes Using Polystyrene Fiber Mats. *Liang, G.*, +, *TED Oct. 2020 4530-4533*

Heat Dissipation Enhancement of Phosphor-Converted White Laser Diodes by Thermally Self-Managing Phosphor-in-Glass. *Peng, Y.*, +, *TED Oct. 2020 4288-4292*

High Output Power GaN-Based Green Resonant-Cavity Light-Emitting Diodes With Trapezoidal Quantum Wells. *Wu, H.*, +, *TED Sept. 2020 3650-3654*

Improving the Efficiency of GaInP/GaAs Light Emitters Using Surface Passivation. *Tripathi, T.S.*, +, *TED Sept. 2020 3667-3672*

Parametric Optimum Design and Performance Improvement of a Thermophotonic Cell. *Yang, Z.*, +, *TED June 2020 2376-2380*

Ring Remote Phosphor Structure for Laser-Driven White Lighting. *Chen, B.*, +, *TED June 2020 2400-2405*

Study of GaN-Based Light-Emitting Diode (LED) With a Hybrid Surface Structure. *Chen, W.*, +, *TED Nov. 2020 4953-4957*

Study on the Photoluminescence Intensity, Thermal Performance, and Color Purity of Quantum Dot Light-Emitting Diodes Using a Pumping-Light Absorber. *Li, Z.*, +, *TED June 2020 2418-2424*

**Light reflection**

Enhancing Luminous Efficiency of Quantum Dot-Based Chip-on-Board Light-Emitting Diodes Using Polystyrene Fiber Mats. *Liang, G.*, +, *TED Oct. 2020 4530-4533*

**Light sources**

Heat Dissipation Enhancement of Phosphor-Converted White Laser Diodes by Thermally Self-Managing Phosphor-in-Glass. *Peng, Y.*, +, *TED Oct. 2020 4288-4292*

**Lighting**

A Lifetime Performance Analysis of LED Luminaires Under Real-Operation Profiles. *Padmasali, A.N.*, +, *TED Jan. 2020 146-153*

Atomized Scan Method for High-Definition Silicon-Based OLED Microdisplays. *Chen, W.*, +, *TED Oct. 2020 4293-4299*

Ga<sub>0.84</sub>In<sub>0.16</sub>As<sub>0.14</sub>Sb<sub>0.86</sub>/InAs<sub>0.91</sub>Sb<sub>0.09</sub> Dual-Junction Device for Thermophotovoltaic Energy Conversion. *Fan, T.*, +, *TED Nov. 2020 4820-4826*

Heat Dissipation Enhancement of Phosphor-Converted White Laser Diodes by Thermally Self-Managing Phosphor-in-Glass. *Peng, Y.*, +, *TED Oct. 2020 4288-4292*

**Linear algebra**

Time Complexity of In-Memory Solution of Linear Systems. *Sun, Z.*, +, *TED July 2020 2945-2951*

**Linear colliders**

Innovative Two-Stage Multibeam Klystron: Concept and Modeling. *Teryaev, V.E.*, +, *TED July 2020 2896-2899*

Modeling and Technical Design Study of Two-Stage Multibeam Klystron for CLIC. *Cai, J.*, +, *TED Aug. 2020 3362-3368*

**Linear systems**

Time Complexity of In-Memory Solution of Linear Systems. *Sun, Z.*, +, *TED July 2020 2945-2951*

**Liquid crystal displays**

Optical Pixel Sensor Based on a-Si:H TFTs to Detect Combined Optical Signals for Multiuser Interactive Displays. *Lin, C.*, +, *TED June 2020 2425-2431*

**Liquid crystal phase transformations**

Fabrication of Ferroelectric Liquid Crystal Thermistor. *Muchenedi, H.K.*, +, *TED Nov. 2020 5063-5068*

**Liquid phase deposition**

Performance Modulation in All-Solution-Driven InCaO<sub>x</sub>/HfGdO<sub>x</sub> Thin-Film Transistors and Exploration in Low-Voltage-Operated Logic Circuits. *Zhang, C.*, +, *TED Oct. 2020 4238-4244*

**Lithium compounds**

A Lithography-Free Fabrication of Low-Operating Voltage-Driven, Very Large Channel Length Graphene Field-Effect Transistor With NH<sub>3</sub> Sensing Application. *Chourasia, N.K.*, +, *TED Oct. 2020 4385-4391*

Experimental Study of the Direct-Charge Beta Radiation Method for Energy Harvesting. *Haim, Y.*, +, *TED Nov. 2020 5076-5081*

Low Operating Voltage Solution Processed (Li<sub>2</sub>ZnO<sub>2</sub>) Dielectric and (SnO<sub>2</sub>) Channel-Based Medium Wave UV-B Phototransistor for Application in Phototherapy. *Singh, A.K.*, +, *TED May 2020 2028-2034*

**Lithography**

High-Frequency Rectifiers Based on Organic Thin-Film Transistors on Flexible Substrates. *Ibrahim, G.H.*, +, *TED June 2020 2365-2371*

**Logic CAD**

Analysis of Failure Mechanisms During the Long-Term Retention Operation in 3-D NAND Flash Memories. *Kim, S.*, +, *TED Dec. 2020 5472-5478*

**Logic circuits**

CMOS-Like Logic Circuits With Unipolar Thin-Film Transistors on Flexible Substrate. *Li, Q.*, +, *TED Feb. 2020 512-517*

Eco-Friendly Fully Water-Driven HfGdO<sub>x</sub> Gate Dielectrics and Its Application in Thin-Film Transistors and Logic Circuits. *Zhang, C.*, +, *TED March 2020 1001-1008*

High-Speed Ring Oscillator Using Skewed Delay Scheme Integrated by Metal-Oxide TFTs. *Xu, W.*, +, *TED Dec. 2020 5526-5531*

Performance Modulation in All-Solution-Driven InCaO<sub>x</sub>/HfGdO<sub>x</sub> Thin-Film Transistors and Exploration in Low-Voltage-Operated Logic Circuits. *Zhang, C.*, +, *TED Oct. 2020 4238-4244*

Printed Logic Gates Based on Enhancement- and Depletion-Mode Electrolyte-Gated Transistors. *Marques, G.C.*, +, *TED Aug. 2020 3146-3151*

**Logic design**

CMOS-Like Logic Circuits With Unipolar Thin-Film Transistors on Flexible Substrate. *Li, Q.*, +, *TED Feb. 2020 512-517*

Computing-in-Memory Architecture Using Energy-Efficient Multilevel Voltage-Controlled Spin-Orbit Torque Device. *Shreya, S.*, +, *TED May 2020 1972-1979*

Energy-Efficient Monolithic 3-D SRAM Cell With BEOL MoS<sub>2</sub> FETs for SoC Scaling. *Hu, V.P.*, +, *TED Oct. 2020 4216-4221*

Printed Logic Gates Based on Enhancement- and Depletion-Mode Electrolyte-Gated Transistors. *Marques, G.C.*, +, *TED Aug. 2020 3146-3151*

Reliability of Logic-in-Memory Circuits in Resistive Memory Arrays. *Zanotti, T.*, +, *TED Nov. 2020 4611-4615*

Variability-Aware Machine Learning Strategy for 3-D NAND Flash Memories. *Ko, K.*, +, *TED April 2020 1575-1580*

**Logic gates**

A Vertical Combo Spacer to Optimize Electrothermal Characteristics of 7-nm Nanosheet Gate-All-Around Transistor. *Liu, R.*, +, *TED June 2020 2249-2254*



- Ambient Temperature-Induced Device Self-Heating Effects on Multi-Fin Si CMOS Logic Circuit Performance in N-14 to N-7 Scaled Technologies. Venkateswarlu, S., +, *TED April 2020 1530-1536*
- Authors' Reply to "Comments on 'An Analytical Surface Potential Model Accounting for the Dual-Modulation Effects in Tunnel FETs'". Wu, C., +, *TED July 2020 3016*
- CMOS-Like Logic Circuits With Unipolar Thin-Film Transistors on Flexible Substrate. Li, Q., +, *TED Feb. 2020 512-517*
- Computing-in-Memory Architecture Using Energy-Efficient Multilevel Voltage-Controlled Spin-Orbit Torque Device. Shreya, S., +, *TED May 2020 1972-1979*
- Corrections to "Low-Voltage IGZO TFTs Using Solution-Deposited OTS-Modified Ta<sub>2</sub>O<sub>5</sub> Dielectric". Mohammadian, N., +, *TED Oct. 2020 4545*
- Corrections to "Opportunities in Device Scaling for 3-nm Node and Beyond: FinFET Versus GAA-FET Versus UFET". Das, U.K., +, *TED Aug. 2020 3496*
- Design and Investigation of Split-Gate MoTe<sub>2</sub>-Based FET as Single Transistor AND Gate Using Nonequilibrium Green's Function. Kumar, P., +, *TED Nov. 2020 5221-5228*
- Design Principles for a Novel Lightweight Configurable PUF Using a Reconfigurable FET. Rajan, C., +, *TED Dec. 2020 5797-5803*
- Device and Circuit-Level Assessment of GaSb/Si Heterojunction Vertical Tunnel-FET for Low-Power Applications. Tripathy, M.R., +, *TED March 2020 1285-1292*
- Experimental Demonstration of Memristor-Aided Logic (MAGIC) Using Valence Change Memory (VCM). Hoffer, B., +, *TED Aug. 2020 3115-3122*
- Printed Logic Gates Based on Enhancement- and Depletion-Mode Electrolyte-Gated Transistors. Marques, G.C., +, *TED Aug. 2020 3146-3151*
- True Random Number Generation From Commodity NVM Chips. Chakraborty, S., +, *TED March 2020 888-894*
- Vertically Stacked Gate-All-Around Structured Tunneling-Based Ternary-CMOS. Kim, S., +, *TED Sept. 2020 3889-3893*
- Loss measurement**
- Analysis of Failure Mechanisms During the Long-Term Retention Operation in 3-D NAND Flash Memories. Kim, S., +, *TED Dec. 2020 5472-5478*
- Losses**
- SiC Trench MOSFET With Reduced Switching Loss and Increased Short-Circuit Capability. Yang, T., +, *TED Sept. 2020 3685-3690*
- Low noise amplifiers**
- A High Gain Low-Noise Amplifier Based on ITO-Stabilized ZnO Thin-Film Transistors. Fan, H., +, *TED Dec. 2020 5537-5543*
- Compact ESD Protection Design for CMOS Low-Noise Amplifier. Lin, C., +, *TED Jan. 2020 33-39*
- Impact of AlGaIn/GaN Interface and Passivation on the Robustness of Low-Noise Amplifiers. Huang, T., +, *TED June 2020 2297-2303*
- Low-k dielectric thin films**
- Ultralow-k Dielectric With Structured Pores for Interconnect Delay Reduction. Xiao, Y., +, *TED May 2020 2071-2075*
- Low-pass filters**
- Design Analysis and Human Tests of Foil-Based Wheezing Monitoring System for Asthma Detection. Khan, S.M., +, *TED Jan. 2020 249-257*
- Low-power electronics**
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- Antiferroelectric Tunnel Junctions as Energy-Efficient Coupled Oscillators: Modeling, Analysis, and Application to Solving Combinatorial Optimization Problems. Andrawis, R., +, *TED July 2020 2974-2980*
- Challenges and Trends in Developing Nonvolatile Memory-Enabled Computing Chips for Intelligent Edge Devices. Hung, J., +, *TED April 2020 1444-1453*
- CMOS-Like Logic Circuits With Unipolar Thin-Film Transistors on Flexible Substrate. Li, Q., +, *TED Feb. 2020 512-517*
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## M

#### Magnesium

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#### Magnetic field measurement

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Magnetoresistive Random Access Memory: Present and Future. *Ikegawa, S.*, +, *TED April 2020 1407-1419*

Modeling of Voltage-Controlled Spin–Orbit Torque MRAM for Multilevel Switching Application. *Shreya, S.*, +, *TED Jan. 2020 90-98*

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#### Magnetic thin films

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Compact Model of All-Optical-Switching Magnetic Elements. *Pel-loux-Prayer, J.*, +, *TED July 2020 2960-2965*

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Spin Hall MTJ Devices for Advanced Neuromorphic Functions. *Stephan, A.W.*, +, *TED Feb. 2020 487-492*

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#### Magnetoelectronics

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- Characterizations of Electrolyte–Insulator–Semiconductor Sensors With Array Wells and a Stack-Sensing Membrane. *Chen, H.J.H.*, +, *TED Sept. 2020 3761-3766*  
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 The Analysis of Potentiometric Flexible Arrayed Urea Biosensor Modified by Graphene Oxide and  $\gamma$ -Fe<sub>2</sub>O<sub>3</sub> Nanoparticles. *Nien, Y.*, +, *TED Nov. 2020 5104-5110*

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- Design of High Robustness BNN Inference Accelerator Based on Binary Memristors. *Qin, Y.*, +, *TED Aug. 2020 3435-3441*  
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- Controllable Functional Layer and Temperature-Dependent Characteristic in Niobium Oxide Insulator–Metal Transition Selector. *Zhang, Z.*, +, *TED July 2020 2771-2777*

- Enhancing Threshold Switching Characteristics and Stability of Vanadium Oxide-Based Selector With Vanadium Electrode. *Yeh, T.*, +, *TED Nov. 2020 5059-5062*

- Modeling and Design of a New Piezoelectronic Transistor for Ultralow-Voltage High-Speed Integrated Circuits. *Shiotsu, Y.*, +, *TED Sept. 2020 3852-3860*

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- A Study on the Temperature-Dependent Operation of Fluorite-Structure-Based Ferroelectric HfO<sub>2</sub> Memory FeFET: A Temperature-Modulated Operation. *Ali, T.*, +, *TED July 2020 2793-2799*

- Analytical Modeling of Short-Channel Effects in MFIS Negative-Capacitance FET Including Quantum Confinement Effects. *Pandey, N.*, +, *TED Nov. 2020 4757-4764*

- Compact Modeling of Negative-Capacitance FDSOI FETs for Circuit Simulations. *Dabhi, C.K.*, +, *TED July 2020 2710-2716*

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Improvement in Long-Term and High-Temperature Retention Stability of Ferroelectric Field-Effect Memory Transistors With Metal–Ferroelectric–Metal–Insulator–Semiconductor Gate-Stacks Using Al-Doped HfO<sub>2</sub> Thin Films. *Yoon, S.*, +, *TED Feb. 2020 499-504*

- Limits on Hysteresis-Free Sub-60 mV/Decade Operation of MFIS Nanowire Transistor. *Semwal, S.*, +, *TED Sept. 2020 3868-3875*
- Modeling the Influence of the Acceptor-Type Trap on the 2DEG Density for GaN MIS-HEMTs. *Shi, Y.*, +, *TED June 2020 2290-2296*
- Simulation Study of Single-Event Burnout in GaN MISFET With Schottky Element. *Wang, Y.*, +, *TED Dec. 2020 5466-5471*
- Mixed analog digital integrated circuits**
- Ambient Temperature-Induced Device Self-Heating Effects on Multi-Fin Si CMOS Logic Circuit Performance in N-14 to N-7 Scaled Technologies. *Venkateswarlu, S.*, +, *TED April 2020 1530-1536*
- Self-Activation Neural Network Based on Self-Selective Memory Device With Rectified Multilevel States. *Wang, Z.*, +, *TED Oct. 2020 4166-4171*
- Mixers (circuits)**
- Analysis of Surface Charge Effects and Edge Fringing Capacitance in Planar GaAs and GaN Schottky Barrier Diodes. *Orfao, B.*, +, *TED Sept. 2020 3530-3535*
- Mixing**
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- Gallium Nitride and Silicon Transistors on 300 mm Silicon Wafers Enabled by 3-D Monolithic Heterogeneous Integration. *Then, H.W.*, +, *TED Dec. 2020 5306-5314*
- GaN Vertical-Channel Junction Field-Effect Transistors With Regrown p-GaN by MOCVD. *Yang, C.*, +, *TED Oct. 2020 3972-3977*
- Improvement of AlN Material Quality by High-Temperature Annealing Toward Power Diodes. *Ni, X.*, +, *TED Oct. 2020 3988-3991*
- V-Pits-Induced Photoresponse Enhancement in AlGaIn UV-B Photodetectors on Si (111). *Rathkanthiwar, S.*, +, *TED Oct. 2020 4281-4287*
- Wafer-Scale Si-GaN Monolithic Integrated E-Mode Cascode FET Realized by Transfer Printing and Self-Aligned Etching Technology. *Zhang, J.*, +, *TED Aug. 2020 3304-3308*
- MODFETs**
- Optimum Carbon Concentration in GaN-on-Silicon for Breakdown Enhancement in AlGaIn/GaN HEMTs. *Remesh, N.*, +, *TED June 2020 2311-2317*
- Molecular beam epitaxial growth**
- Effects of Annealing on the Behavior of Sn in GeSn Alloy and GeSn-Based Photodetectors. *Wang, L.*, +, *TED Aug. 2020 3229-3234*
- Large-Scale Fabrication of Submicrometer-Gate-Length MOSFETs With a Trilayer PtSe<sub>2</sub> Channel Grown by Molecular Beam Epitaxy. *Xiong, K.*, +, *TED March 2020 796-801*
- Molecular biophysics**
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- Optimization of Hetero-Gate-Dielectric Tunnel FET for Label-Free Detection and Identification of Biomolecules. *Ghosh, S.*, +, *TED May 2020 2157-2164*
- Molybdenum compounds**
- Alcohol-Based Sulfur Treatment for Improved Performance and Yield in Local Back-Gated and Channel-Length-Scaled MoS<sub>2</sub> FETs. *Sanjay, S.*, +, *TED Sept. 2020 3711-3715*
- Bias Stress Instability in Multilayered MoS<sub>2</sub> Field-Effect Transistors Under Pulse-Mode Operation. *Seo, S.G.*, +, *TED April 2020 1864-1872*
- Chalcogen-Assisted Enhanced Atomic Orbital Interaction at TMD-Metal Interface and Sulfur Passivation for Overall Performance Boost of 2-D TMD FETs. *Ansh, .*, +, *TED Feb. 2020 717-724*
- Conductance in a Nanoribbon of Topologically Insulating MoS<sub>2</sub> in the 1T' Phase. *Sverdlov, V.*, +, *TED Nov. 2020 4687-4690*
- Design and Characterization of MoO<sub>3</sub>/Mg/MoO<sub>3</sub> Interfaces. *Khusayfan, N.M.*, +, *TED Oct. 2020 4354-4359*
- Design and Investigation of Split-Gate MoTe<sub>2</sub>-Based FET as Single Transistor AND Gate Using Nonequilibrium Green's Function. *Kumar, P.*, +, *TED Nov. 2020 5221-5228*
- Energy-Efficient Monolithic 3-D SRAM Cell With BEOL MoS<sub>2</sub> FETs for SoC Scaling. *Hu, Y.P.*, +, *TED Oct. 2020 4216-4221*
- High-Quality CVD-MoS<sub>2</sub> Synthesized on Surface-Modified Al<sub>2</sub>O<sub>3</sub> for High-Performance MoS<sub>2</sub> Field-Effect Transistors. *Song, X.*, +, *TED Nov. 2020 5196-5200*
- Monolayer MoSe<sub>2</sub>-Based Tunneling Field Effect Transistor for Ultrasensitive Strain Sensing. *Dubey, P.K.*, +, *TED May 2020 2140-2146*
- Performance Evaluation and Device Physics Investigation of Negative-Capacitance MOSFETs Based on Ultrathin Body Silicon and Monolayer MoS<sub>2</sub>. *Luo, S.*, +, *TED Aug. 2020 3049-3055*
- Realistic Modeling of MoS<sub>2</sub> Piezoelectric Transistor. *Alidoosty-Shahraki, M.*, +, *TED Aug. 2020 3459-3465*
- Ultralow Current Switching in Flexible Hybrid PVP:MoS<sub>2</sub>/HfO<sub>x</sub> Bilayer Devices. *Varun, I.*, +, *TED Aug. 2020 3472-3477*
- Ultrasensitive Detection of Mercury Ions Under UV Illumination of MoS<sub>2</sub> Functionalized AlGaIn/GaN Transistor. *Nigam, A.*, +, *TED Dec. 2020 5693-5700*
- Monolayers**
- A Lithography-Free Fabrication of Low-Operating Voltage-Driven, Very Large Channel Length Graphene Field-Effect Transistor With NH<sub>3</sub> Sensing Application. *Chourasia, N.K.*, +, *TED Oct. 2020 4385-4391*
- Assessing the Role of a Semiconductor's Anisotropic Permittivity in Hafnium Disulfide Monolayer Field-Effect Transistors. *Bennett, R.K.A.*, +, *TED June 2020 2607-2613*
- Effect of Self-Assembled Monolayers (SAMs) as Surface Passivation on the Flexible a-InSnZnO Thin-Film Transistors. *Zhong, W.*, +, *TED Aug. 2020 3157-3162*
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- Impact of Gate-Source/Drain Underlap on the Performance of Monolayer SiC Schottky-Barrier Field-Effect Transistor. *Xie, H.*, +, *TED Oct. 2020 4130-4135*
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- Low-Voltage IGZO TFTs Using Solution-Deposited OTS-Modified Ta<sub>2</sub>O<sub>5</sub> Dielectric. *Mohammadian, N.*, +, *TED April 2020 1625-1631*
- Monolayer MoSe<sub>2</sub>-Based Tunneling Field Effect Transistor for Ultrasensitive Strain Sensing. *Dubey, P.K.*, +, *TED May 2020 2140-2146*
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- Theoretical Analysis of Ballistic Current Transport in Monolayer Black Arsenic MOSFETs. *Seo, J.E.*, +, *TED Feb. 2020 622-626*
- Monolithic integrated circuits**
- Scaling Trends of Monolithic 3-D Complementary Metal-Oxide-Semiconductor Nanoelectromechanical Reconfigurable Logic Circuits. *Ko, J.W.*, +, *TED Sept. 2020 3861-3867*
- Monte Carlo methods**
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- A Simple Method to Realize Millilens Array on Encapsulant Layer for Enhancing Light Efficiency of COB-LEDs. *Yu, X.*, +, *TED Sept. 2020 3655-3659*
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- Investigation of Contact Edge Effects in the Channel of Planar Gunn Diodes. *Mindil, A.*, +, *TED Jan. 2020 53-56*
- Investigation of High-Frequency Fine Structure in the Current Output of Shaped Contact Planar Gunn Diodes. *Mindil, A.*, +, *TED May 2020 1946-1951*
- Kinetic Monte Carlo Simulation of Interface-Controlled Hafnia-Based Resistive Memory. *Xu, X.*, +, *TED Jan. 2020 118-124*
- Lower Power, Better Uniformity, and Stability CBRAM Enabled by Graphene Nanohole Interface Engineering. *Liu, Y.*, +, *TED March 2020 984-988*
- Mechanism for Unipolar Reset in Negative Thermophoresis Resistive Memory Devices. *Xu, X.*, +, *TED Dec. 2020 5815-5818*
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- Systematic Modeling of Electrostatics, Transport, and Statistical Variability Effects of Interface Traps in End-of-the-Roadmap III-V MOSFETs. *Zagni, N.*, +, *TED April 2020 1560-1566*
- Write-Efficient STT/SOT Hybrid Triple-Level Cell for High-Density MRAM. *Xu, Y.*, +, *TED April 2020 1460-1465*
- MOS capacitors**
- A First Evaluation of Thick Oxide 3C-SiC MOS Capacitors Reliability. *Li, F.*, +, *TED Jan. 2020 237-242*
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- Improved TDDB Reliability and Interface States in 5-nm Hf<sub>0.5</sub>Zr<sub>0.5</sub>O<sub>2</sub> Ferroelectric Technologies Using NH<sub>3</sub> Plasma and Microwave Annealing. *Chen, Y.*, +, *TED April 2020 1581-1585*
- Influence of Metal Gate Electrodes on Electrical Properties of Atomic-Layer-Deposited Al-Rich HfAlO/Ga<sub>2</sub>O<sub>3</sub> MOSCAPs. *Zhang, H.*, +, *TED April 2020 1730-1736*
- Near-Interface Trap Model for the Low Temperature Conductance Signal in SiC MOS Capacitors With Nitrided Gate Oxides. *Nicholls, J.R.*, +, *TED Sept. 2020 3722-3728*
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- Hot Carrier Degradation-Induced Dynamic Variability in FinFETs: Experiments and Modeling. *Yu, Z.*, +, *TED April 2020 1517-1522*
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- Evaluation of Dynamic Avalanche Performance in 1.2-kV MOS-Bipolar Devices. *Luo, P.*, +, *TED Sept. 2020 3691-3697*
- MOSFET**
- 4H-SiC CMOS Transimpedance Amplifier of Gamma-Irradiation Resistance Over 1 MGy. *Masunaga, M.*, +, *TED Jan. 2020 224-229*
- 4H-SiC UMOFET With an Electric Field Modulation Region Below P-Body. *Cheng, Y.*, +, *TED Aug. 2020 3298-3303*
- $V_t$  Extraction Methodologies Influence Process Induced  $V_t$  Variability: Does This Fact Still Hold for Advanced Technology Nodes?. *Bhoir, M.S.*, +, *TED Nov. 2020 4691-4695*
- A Junctionless Accumulation Mode NC-FinFET Gate Underlap Design for Improved Stability and Self-Heating Reduction. *Kumar, M.*, +, *TED Aug. 2020 3424-3430*
- A Low-Reverse-Recovery-Charge Superjunction MOSFET With P-Base and N-Pillar Schottky Contacts. *Li, P.*, +, *TED April 2020 1693-1698*
- A Method for Series-Resistance-Immune Extraction of Low-Frequency Noise Parameters in Nanoscale MOSFETs. *Tataridou, A.*, +, *TED Nov. 2020 4568-4572*
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- A Novel 3.3-kV Integrated ETO (IETO) With Single-Gate Controlling. *Chen, R.*, +, *TED May 2020 2052-2057*
- A Predictive 3-D Source/Drain Resistance Compact Model and the Impact on 7 nm and Scaled FinFETs. *Wu, T.*, +, *TED June 2020 2255-2262*
- A Review of Hot Carrier Degradation in n-Channel MOSFETs—Part I: Physical Mechanism. *Mahapatra, S.*, +, *TED July 2020 2660-2671*
- A Review of Hot Carrier Degradation in n-Channel MOSFETs—Part II: Technology Scaling. *Mahapatra, S.*, +, *TED July 2020 2672-2681*
- A Stochastic Framework for the Time Kinetics of Interface and Bulk Oxide Traps for BTI, SILC, and TDDB in MOSFETs. *Kumar, S.*, +, *TED Nov. 2020 4741-4748*
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- An Iterative Surface Potential Algorithm Including Interface Traps for Compact Modeling of SiC-MOSFETs. *Albrecht, M.*, +, *TED March 2020 855-862*
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- Analysis of RF Inductive Effect in S-Parameters of Body Contact PD-SOI MOSFETs. *Lee, K.*, +, *TED Oct. 2020 4054-4059*
- Analytical Model Developed for Precise Stress Estimation of Device Channel Within Advanced Planar MOSFET Architectures. *Lee, C.*, +, *TED April 2020 1498-1505*
- Analytical Model for Interface Traps-Dependent Back Bias Capability and Variability in Ultrathin Body and Box FDSOI MOSFETs. *Chen, W.*, +, *TED Nov. 2020 4573-4577*
- Application of 2DHG Diamond p-FET in Cascade With Normally-OFF Operation and a Breakdown Voltage of Over 1.7 kV. *Bi, T.*, +, *TED Oct. 2020 4006-4009*
- Breakdown Voltage Walk-in Phenomenon and Optimization for the Trench-Gate p-Type VDMOS Under Single Avalanche Stress. *Tong, X.*, +, *TED June 2020 2445-2450*
- BSIM Compact Model of Quantum Confinement in Advanced Nanosheet FETs. *Dasgupta, A.*, +, *TED Feb. 2020 730-737*
- Capacitorless 2T-DRAM for Higher Retention Time and Sense Margin. *Ansari, M.H.R.*, +, *TED March 2020 902-906*
- Charge-Based Compact Drain Current Modeling of InAs-OI-Si MOSFET Including Subband Energies and Band Nonparabolicity. *Maity, S.K.*, +, *TED June 2020 2282-2289*
- Comparative Analysis of Hot Carrier Degradation (HCD) in 10-nm Node nMOS/pMOS FinFET Devices. *Kim, J.*, +, *TED Dec. 2020 5396-5402*
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- Cryogenic Operation of Thin-Film FDSOI nMOS Transistors: The Effect of Back Bias on Drain Current and Transconductance. *Casse, M.*, +, *TED Nov. 2020 4636-4640*
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- Deep-Depletion Effect in SOI Substrates and its Application in Photodetectors With Tunable Responsivity and Detection Range. *Arsalan, M.*, +, *TED Aug. 2020 3256-3262*
- Design and Investigation of Split-Gate MoTe<sub>2</sub>-Based FET as Single Transistor AND Gate Using Nonequilibrium Green's Function. *Kumar, P.*, +, *TED Nov. 2020 5221-5228*
- Design Considerations for Si- and Ge-Stacked Nanosheet pMOSFETs Based on Quantum Transport Simulations. *Zhang, S.*, +, *TED Jan. 2020 26-32*
- Design Optimization Techniques in Nanosheet Transistor for RF Applications. *Kushwaha, P.*, +, *TED Oct. 2020 4515-4520*
- Design Principles of Self-Compensated NBTI-Free Negative Capacitor FinFET. *Karda, K.*, +, *TED June 2020 2238-2242*
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- Effect of Charge Partitioning on IM3 Prediction in SOI-LDMOS Transistors. *Gupta, S.*, +, *TED Feb. 2020 606-613*
- Effects of Contact Potential and Sidewall Surface Plane on the Performance of GaN Vertical Nanowire MOSFETs for Low-Voltage Operation. *Son, D.*, +, *TED April 2020 1547-1552*
- Effects of Interface Traps and Self-Heating on the Performance of GAA GaN Vertical Nanowire MOSFET. *Thingujam, T.*, +, *TED March 2020 816-821*
- Effects of Scaling on Analog FoMs of UTBB FD-SOI MOS Transistors: A Detailed Analysis. *Bhoir, M.S.*, +, *TED Aug. 2020 3035-3041*
- Engineering a Unified Dielectric Solution for AlGaIn/GaN MOS-HFET Gate and Access Regions. *Azam, F.*, +, *TED March 2020 881-887*
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- Equivalent DG Dimensions Concept for Compact Modeling of Short-Channel and Thin Body GAA MOSFETs Including Quantum Confinement. *Yilmaz, K.*, +, *TED Dec. 2020 5381-5387*
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- Fin-Gated Nanochannel Array Gate-Recessed AlGaIn/GaN Metal-Oxide-Semiconductor High-Electron-Mobility Transistors. *Lee, C.*, +, *TED May 2020 1939-1945*
- Free Carrier Mobility, Series Resistance, and Threshold Voltage Extraction in Junction FETs. *Makris, N.*, +, *TED Nov. 2020 4658-4661*
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- High-Quality CVD-MoS<sub>2</sub> Synthesized on Surface-Modified Al<sub>2</sub>O<sub>3</sub> for High-Performance MoS<sub>2</sub> Field-Effect Transistors. *Song, X.*, +, *TED Nov. 2020 5196-5200*
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- Hot-Carrier-Induced Degradation and Optimization for 700-V High-Voltage Lateral DMOS by the AC Stress. *Liu, S.*, +, *TED March 2020 1090-1097*
- Impact of AlInN Back-Barrier Over AlGaIn/GaN MOS-HEMT With HfO<sub>2</sub> Dielectric Using Cubic Spline Interpolation Technique. *Sandeep, V.*, +, *TED Sept. 2020 3558-3563*
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- Impact of Width Scaling and Parasitic Series Resistance on the Performance of Silicene Nanoribbon MOSFETs. *Poljak, M.*, +, *TED Nov. 2020 4705-4708*
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- Investigation of the Temperature Dependence of Hot-Carrier Degradation in Si MOSFETs Using Spectroscopic Charge Pumping. *Ruch, B.*, +, *TED Oct. 2020 4092-4098*
- Investigations of SiC MOSFET Short-Circuit Failure Mechanisms Using Electrical, Thermal, and Mechanical Stress Analyses. *Yao, K.*, +, *TED Oct. 2020 4328-4334*
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- Local Variability Evaluation on Effective Channel Length Extracted With Shift-and-Ratio Method. *Brito, J.P.M.*, +, *TED Nov. 2020 4662-4666*
- Low-Frequency Noise Assessment of Vertically Stacked Si n-Channel Nanosheet FETs With Different Metal Gates. *Oliveira, A.*, +, *TED Nov. 2020 4802-4807*
- Low-Frequency Noise Characteristics Under the OFF-State Stress. *Lee, G.*, +, *TED Oct. 2020 4366-4371*
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- Low-Frequency Noise Investigation of GaN/AlGaIn Metal-Oxide-Semiconductor High-Electron-Mobility Field-Effect Transistor With Different Gate Length and Orientation. *Takakura, K.*, +, *TED Aug. 2020 3062-3068*
- Mitigating Pillar-to-Pillar Variability of Ground Select Transistor in 3-D NAND Flash Memory. *Bhatt, U.M.*, +, *TED Oct. 2020 4152-4157*
- Mixed Hot-Carrier/Bias Temperature Instability Degradation Regimes in Full {*V<sub>G</sub>*, *V<sub>D</sub>*} Bias Space: Implications and Peculiarities. *Jech, M.*, +, *TED Aug. 2020 3315-3322*
- Modeling of Current Mismatch and 1/*f* Noise for Halo-Implanted Drain-Extended MOSFETs. *Gupta, C.*, +, *TED Nov. 2020 4794-4801*
- Modeling of Short-Channel Effects in GaN HEMTs. *Allaei, M.*, +, *TED Aug. 2020 3088-3094*
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- MOSFETs' Electrical Performance in the 160-nm BCD Technology Process With the Diamond Layout Shape. *Barri, D.*, +, *TED Aug. 2020 3270-3277*
- Near-Interface Trap Model for the Low Temperature Conductance Signal in SiC MOS Capacitors With Nitrided Gate Oxides. *Nicholls, J.R.*, +, *TED Sept. 2020 3722-3728*
- New *C<sup>∞</sup>* Functions for Drain-Source Voltage Clamping in Transistor Modeling. *Xia, K.*, +, *TED April 2020 1764-1768*
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- Long-Term Aging of Al<sub>2</sub>O<sub>3</sub> Passivated and Unpassivated Flexible a-IGZO TFTs. *Costa, J.C.*, +, *TED Nov. 2020 4934-4939*
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- Passivation of n- and p-Type Silicon Surfaces With Spray-Coated Sol-Gel Silicon Oxide Thin Film. *Bhajibale, J.*, +, *TED Nov. 2020 5045-5052*
- Physical Insights Into the Mobility Enhancement in Amorphous InGaZnO Thin-Film Transistor by SiO<sub>2</sub> Passivation Layer. *Zhang, P.*, +, *TED June 2020 2352-2358*
- Quantitative Analysis of High-Pressure Deuterium Annealing Effects on Vertically Stacked Gate-All-Around SONOS Memory. *Yu, J.*, +, *TED Sept. 2020 3903-3907*
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- Design Analysis and Human Tests of Foil-Based Wheezing Monitoring System for Asthma Detection. *Khan, S.M.*, +, *TED Jan. 2020 249-257*
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Degradation Behavior and Mechanisms of E-Mode GaN HEMTs With p-GaN Gate Under Reverse Electrostatic Discharge Stress. *Chen, Y.Q.*, +, *TED Feb. 2020 566-570*

Edge Termination for III-Nitride Vertical Power Devices Using Polarization Engineering. *Peart, M.R.*, +, *TED Feb. 2020 571-575*

Numerical Solutions for Electric Field Lines and Breakdown Voltages in Superjunction-Like Power Devices. *Huang, H.*, +, *TED Sept. 2020 3898-3902*

**Power semiconductor diodes**

A Novel Self-Controlled Double Trench Gate Snapback Free Reverse-Conducting IGBT With a Built-in Trench Barrier Diode. *Liu, Z.*, +, *TED April 2020 1705-1711*

A Trench-Field-Plate High-Voltage Power MOSFET. *Xiao, C.*, +, *TED June 2020 2482-2488*

Design and Fabrication of Vertical Metal/TiO<sub>2</sub>/ $\beta$ -Ga<sub>2</sub>O<sub>3</sub> Dielectric Heterojunction Diode With Reverse Blocking Voltage of 1010 V. *Hu, Z.*, +, *TED Dec. 2020 5628-5632*

Design Strategies for Mesa-Type GaN-Based Schottky Barrier Diodes for Obtaining High Breakdown Voltage and Low Leakage Current. *Jia, X.*, +, *TED May 2020 1931-1938*

Edge Termination With Enhanced Field-Limiting Rings Insensitive to Surface Charge for High-Voltage SiC Power Devices. *Hirao, T.*, +, *TED July 2020 2850-2853*

Improvement of AlN Material Quality by High-Temperature Annealing Toward Power Diodes. *Ni, X.*, +, *TED Oct. 2020 3988-3991*

Modeling of the Vertical Leakage Current in AlN/Si Heterojunctions for GaN Power Applications. *Borga, M.*, +, *TED Feb. 2020 595-599*

N-Buffer Design for Silicon-Based Power Diode Targeting High Dynamic Robustness and High Operating Temperature Over 448 K. *Nakamura, K.*, +, *TED June 2020 2437-2444*

Tri-Gated Hybrid Anode AlGaN/GaN Power Diode With Intrinsic Low Turn-on Voltage and Ultralow Reverse Leakage Current. *Zhou, Q.*, +, *TED April 2020 1712-1717*

**Power semiconductor switches**

Characterization and Extraction of Power Loop Stray Inductance With SiC Half-Bridge Power Module. *Liu, Y.*, +, *TED Oct. 2020 4040-4045*

Impact of AlInN Back-Barrier Over AlGaN/GaN MOS-HEMT With HfO<sub>2</sub> Dielectric Using Cubic Spline Interpolation Technique. *Sandeep, V.*, +, *TED Sept. 2020 3558-3563*

Measurement and Analysis for Time Jitter of Reversely Switched Dynistor. *Pi, Y.*, +, *TED Nov. 2020 5012-5019*

**Praseodymium compounds**

Investigating Transient Characteristics of Volatile Hysteresis and Self-Heating of PrMnO<sub>3</sub>-Based RRAM. *Sakhujia, J.*, +, *TED Dec. 2020 5520-5525*  
 Reaction-Drift Model for Switching Transients in Pr<sub>0.7</sub>Ca<sub>0.3</sub>MnO<sub>3</sub>-Based Resistive RAM. *Saraswat, V.*, +, *TED Sept. 2020 3610-3617*

**Pressure measurement**

Highly Sensitive, Wide-Range, and Flexible Pressure Sensor Based on Honeycomb-Like Graphene Network. *Tian, Y.*, +, *TED May 2020 2153-2156*

**Pressure sensors**

A Micromachined Resonant Differential Pressure Sensor. *Li, Y.*, +, *TED Feb. 2020 640-645*

Highly Sensitive, Wide-Range, and Flexible Pressure Sensor Based on Honeycomb-Like Graphene Network. *Tian, Y.*, +, *TED May 2020 2153-2156*

Matrix-Addressed Flexible Capacitive Pressure Sensor With Suppressed Crosstalk for Artificial Electronic Skin. *Chen, S.*, +, *TED July 2020 2940-2944*

**Printed circuits**

A CMOS-MEMS Thermal-Piezoresistive Oscillator for Mass Sensing Applications. *Zope, A.A.*, +, *TED March 2020 1183-1191*

A New Approach for Developing a 3-D Stress Sensing Rosette Featuring Strain Engineering. *Balbola, A.A.*, +, *TED Feb. 2020 646-651*

**Printing**

Audio System Fabricated With Flexible Hybrid Electronics. *Street, R.A.*, +, *TED March 2020 1270-1276*

The Analysis of Potentiometric Flexible Arrayed Urea Biosensor Modified by Graphene Oxide and  $\gamma$ -Fe<sub>2</sub>O<sub>3</sub> Nanoparticles. *Nien, Y.*, +, *TED Nov. 2020 5104-5110*

**Probability**

General Approach to Model the Surface Charge Induced by Multiple Surface Chemical Reactions in Potentiometric FET Sensors. *Mele, L.J.*, +, *TED March 2020 1149-1156*

Thermal Brownian Motion of Skyrmion for True Random Number Generation. *Yao, Y.*, +, *TED June 2020 2553-2558*

**Process monitoring**

On-Wafer FinFET-Based EUV/eBeam Detector Arrays for Advanced Lithography Processes. *Wang, C.*, +, *TED June 2020 2406-2413*

**Prosthetic power supplies**

Retinal Prosthesis Using Thin-Film Devices on a Transparent Substrate and Wireless Power Transfer. *Tomioka, K.*, +, *TED Feb. 2020 529-534*

**Prosthetics**

Matrix-Addressed Flexible Capacitive Pressure Sensor With Suppressed Crosstalk for Artificial Electronic Skin. *Chen, S.*, +, *TED July 2020 2940-2944*

**Protective coatings**

Technological Sensor on Coupled Radial Spirals. *Pchel'nikov, Y.N.*, +, *TED March 2020 1165-1170*

**Pseudopotential methods**

Full-Band Quantum Transport of Heterojunction Electron Devices With Empirical Pseudopotentials. *M'foukh, A.*, +, *TED Dec. 2020 5662-5668*

**Pulse generators**

A Multigap Multiaperture Pseudospark Switch and Its Performance Analysis for High-Voltage Applications. *Pal, U.N.*, +, *TED Dec. 2020 5600-5604*

**Pulse measurement**

Phase-Sensitive Pulse Sensor Using 2-D Active Plasmonics on Conformal Substrates. *Sohrabi, F.*, +, *TED Oct. 2020 4379-4384*

Single Pulse Charge Pumping Measurements on GaN MOS-HEMTs: Fast and Reliable Extraction of Interface Traps Density. *Alghamdi, S.*, +, *TED Feb. 2020 444-448*

**Pulse width modulation**

Atomized Scan Method for High-Definition Silicon-Based OLED Microdisplays. *Chen, W.*, +, *TED Oct. 2020 4293-4299*

**Pulsed laser deposition**

Amorphous p-Type CuNiSnO Thin-Film Transistors Processed at Low Temperatures. *Cheng, X.*, +, *TED June 2020 2336-2341*

**Pulsed power supplies**

A Multigap Multiaperture Pseudospark Switch and Its Performance Analysis for High-Voltage Applications. *Pal, U.N.*, +, *TED Dec. 2020 5600-5604*

**Pulsed power switches**

A Multigap Multiaperture Pseudospark Switch and Its Performance Analysis for High-Voltage Applications. *Pal, U.N.*, +, *TED Dec. 2020 5600-5604*

**Pyroelectric devices**

A Study on the Temperature-Dependent Operation of Fluorite-Structure-Based Ferroelectric HfO<sub>2</sub> Memory FeFET: Pyroelectricity and Reliability. *Ali, T.*, +, *TED July 2020 2981-2987*

**Pyroelectricity**

A Study on the Temperature-Dependent Operation of Fluorite-Structure-Based Ferroelectric HfO<sub>2</sub> Memory FeFET: Pyroelectricity and Reliability. *Ali, T.*, +, *TED July 2020 2981-2987*

Negative/Positive Electrocaloric Effect in Single-Layer Pb(Zr<sub>x</sub>Ti<sub>1-x</sub>)O<sub>3</sub> Thin Films for Solid-State Cooling Device. *Prasad Bag, S.*, +, *TED April 2020 1769-1775*

**Pyrolysis**

Amorphous ITZO Thin-Film Transistors by Using Ultrasonic Spray Pyrolysis Deposition. *Liu, H.*, +, *TED March 2020 1009-1013*

Highly Stable, Nanocrystalline, ZnO Thin-Film Transistor by Spray Pyrolysis Using High-K Dielectric. *Saha, J.K.*, +, *TED March 2020 1021-1026*

MgZnO-Based Schottky Barrier Ultraviolet-B Photodiode by Ultrasonic Spray Pyrolysis Deposition. *Liu, H.*, +, *TED Jan. 2020 173-178*

**Q****Q factor**

A V-Band Overmoded Coaxial Millimeter-Wave Oscillator Based on a New Method of Asymmetric Modes Suppression. *Chen, S.*, +, *TED June 2020 2573-2579*

A CMOS-MEMS Thermal-Piezoresistive Oscillator for Mass Sensing Applications. *Zope, A.A.*, +, *TED March 2020 1183-1191*

A Micromachined Resonant Differential Pressure Sensor. *Li, Y.*, +, *TED Feb. 2020 640-645*

An Analytical Model for Distributed Capacitance in Up-Down Series Stacked Inductors. *Tayenjam, S.*, +, *TED Sept. 2020 3510-3515*

Compact Modeling and Behavioral Simulation of an Optomechanical Sensor in Verilog A. *Dawale, H.E.*, +, *TED Nov. 2020 4677-4681*

Design of Cavity for Quasi-Optical Gyrotron Step-Tunable Across Multi-band. *Ma, G.*, +, *TED Oct. 2020 4426-4431*

Evaluation of High-Temperature High-Frequency GaN-Based LC-Oscillator Components. *Ottaviani, A.*, +, *TED Nov. 2020 4587-4591*

Highly Tunable High-Q Inversion-Mode MOS Varactor in the 1–325-GHz Band. *Margalef-Rovira, M.*, +, *TED June 2020 2263-2269*

Modeling of High-Q Conical Inductors and MOM Capacitors for Millimeter-Wave Applications. *Jeyaraman, S.*, +, *TED Dec. 2020 5646-5652*

Polarization Independent Band Gaps in CMOS Back-End-of-Line for Monolithic High-Q MEMS Resonator Confinement. *Hudeczek, R.*, +, *TED Nov. 2020 4578-4581*

**Quantum chemistry**

Chalcogen-Assisted Enhanced Atomic Orbital Interaction at TMD-Metal Interface and Sulfur Passivation for Overall Performance Boost of 2-D TMD FETs. *Ansh, .*, +, *TED Feb. 2020 717-724*

**Quantum confined Stark effect**

High Output Power GaN-Based Green Resonant-Cavity Light-Emitting Diodes With Trapezoidal Quantum Wells. *Wu, H.*, +, *TED Sept. 2020 3650-3654*

**Quantum dots**

Enhancing Luminous Efficiency of Quantum Dot-Based Chip-on-Board Light-Emitting Diodes Using Polystyrene Fiber Mats. *Liang, G.*, +, *TED Oct. 2020 4530-4533*

**Quantum statistical mechanics**

A Compact Current-Voltage Model for 2-D-Semiconductor-Based Lateral Homo-/Hetero-Junction Tunnel-FETs. *Pal, A.*, +, *TED Oct. 2020 4473-4481*

A Physics-Based Compact Model for Ultrathin Black Phosphorus FETs—Part I: Effect of Contacts, Temperature, Ambipolarity, and Traps. *Yar-moghaddam, E.*, +, *TED Jan. 2020 389-396*



**Quantum well devices**

Efficient Carrier Transport for AlGaIn-Based Deep-UV LEDs With Graded Superlattice p-AlGaIn. *Mondal, R.K.*, +, *TED April 2020 1674-1679*

**Quantum well lasers**

Low-Voltage AlGaAs/GaAs Thyristors as High-Peak-Current Pulse Switches for High-Power Semiconductor Laser Pumping. *Slipchenko, S.O.*, +, *TED Jan. 2020 193-197*

**R****Radar imaging**

Analysis of Phase Characteristics of Gyrotron Traveling-Wave Tubes. *Li, Y.*, +, *TED May 2020 2170-2175*

**Radar resolution**

Analysis of Phase Characteristics of Gyrotron Traveling-Wave Tubes. *Li, Y.*, +, *TED May 2020 2170-2175*

**Radiation detection**

Encapsulated X-Ray Detector Enabled by All-Inorganic Lead-Free Perovskite Film With High Sensitivity and Low Detection Limit. *Zhang, H.*, +, *TED Aug. 2020 3191-3198*

**Radiation hardening (electronics)**

Half-Select-Free Low-Power Dynamic Loop-Cutting Write Assist SRAM Cell for Space Applications. *Pal, S.*, +, *TED Jan. 2020 80-89*

Impact of Varied Buffer Layer Designs on Single-Event Response of 1.2-kV SiC Power MOSFETs. *Lu, J.*, +, *TED Sept. 2020 3698-3704*

Simulation Study of Single-Event Burnout in GaN MISFET With Schottky Element. *Wang, Y.*, +, *TED Dec. 2020 5466-5471*

Single-Event Burnout Hardening Method and Evaluation in SiC Power MOSFET Devices. *Bi, J.*, +, *TED Oct. 2020 4340-4345*

Understanding  $\gamma$ -Ray Induced Instability in AlGaIn/GaN HEMTs Using a Physics-Based Compact Model. *Sharma, C.*, +, *TED March 2020 1126-1131*

**Radiation pressure**

Compact Modeling and Behavioral Simulation of an Optomechanical Sensor in Verilog A. *Dawale, H.E.*, +, *TED Nov. 2020 4677-4681*

Gallium Nitride: A Versatile Compound Semiconductor as Novel Piezoelectric Film for Acoustic Tweezer in Manipulation of Cancer Cells. *Sun, C.*, +, *TED Aug. 2020 3355-3361*

Low-Frequency Noise Spectroscopy Characterization of HgCdTe Infrared Detectors. *Zhu, L.*, +, *TED Feb. 2020 547-551*

**Radiation therapy**

Low Operating Voltage Solution Processed ( $\text{Li}_2\text{ZnO}_2$ ) Dielectric and ( $\text{SnO}_2$ ) Channel-Based Medium Wave UV-B Phototransistor for Application in Phototherapy. *Singh, A.K.*, +, *TED May 2020 2028-2034*

**Radiofrequency filters**

A Reconfigurable Surface Acoustic Wave Filter on ZnO/AlGaIn/GaN Heterostructure. *Bahamonde, J.A.*, +, *TED Oct. 2020 4507-4514*

**Radiofrequency integrated circuits**

Compact Modeling and Electrothermal Measurements of Indirectly Heated Phase-Change RF Switches. *Wainstein, N.*, +, *TED Nov. 2020 5182-5187*

Poly-Si Finlike Thin-Film Transistors With Various Wide Drain Designs for Radio Frequency and 3-D Integrated Circuits. *Hu, H.*, +, *TED June 2020 2342-2345*

**Radiofrequency power amplifiers**

Device, Circuit, and Reliability Assessment of Drain-Extended FinFETs for Sub-14 nm System on Chip Applications. *Kumar, B.S.*, +, *TED Nov. 2020 4728-4735*

Novel Drain-Connected Field Plate GaN HEMT Designs for Improved  $V_{\text{BD}}-R_{\text{ON}}$  Tradeoff and RF PA Performance. *Soni, A.*, +, *TED April 2020 1718-1725*

**Raman spectra**

Nanocomposite Material Characterization of a Solid-State Fractional Capacitor. *John, D.A.*, +, *TED March 2020 1136-1142*

Optimized Resistive Switching in  $\text{TiO}_2$  Nanotubes by Modulation of Oxygen Vacancy Through Chemical Reduction. *Hazra, A.*, +, *TED May 2020 2197-2204*

**Raman spectroscopy**

Chalcogen-Assisted Enhanced Atomic Orbital Interaction at TMD-Metal Interface and Sulfur Passivation for Overall Performance Boost of 2-D TMD FETs. *Ansh, .*, +, *TED Feb. 2020 717-724*

Electro-Thermo-Mechanical Reliability of Recessed Barrier AlGaIn/GaN Schottky Diodes Under Pulse Switching Conditions. *Shankar, B.*, +, *TED May 2020 2044-2051*

**Random noise**

A Novel Confined Nitride-Trapping Layer Device for 3-D NAND Flash With Robust Retention Performances. *Fu, C.*, +, *TED March 2020 989-994*

Comparison of Dark Current Random Telegraph Signals in Silicon and InSb-Based Photodetector Pixel Arrays. *Durnez, C.*, +, *TED Nov. 2020 4940-4946*

Efficient and Robust Spike-Driven Deep Convolutional Neural Networks Based on NOR Flash Computing Array. *Xiang, Y.*, +, *TED June 2020 2329-2335*

Exploring the Impact of Random Telegraph Noise-Induced Accuracy Loss on Resistive RAM-Based Deep Neural Network. *Du, Y.*, +, *TED Aug. 2020 3335-3340*

Variability Effects in Nanowire and Macaroni MOSFETs—Part I: Random Dopant Fluctuations. *Spinelli, A.S.*, +, *TED April 2020 1485-1491*

Variability Effects in Nanowire and Macaroni MOSFETs—Part II: Random Telegraph Noise. *Spinelli, A.S.*, +, *TED April 2020 1492-1497*

**Random number generation**

Lightweight Integrated Design of PUF and TRNG Security Primitives Based on eFlash Memory in 55-nm CMOS. *Larimian, S.*, +, *TED April 2020 1586-1592*

Thermal Brownian Motion of Skyrmion for True Random Number Generation. *Yao, Y.*, +, *TED June 2020 2553-2558*

True Random Number Generation From Commodity NVM Chips. *Chakraborty, S.*, +, *TED March 2020 888-894*

**Random-access storage**

$J_{\text{SW}}$  of 5.5 MA/cm<sup>2</sup> and RA of 5.2- $\Omega \cdot \mu\text{m}^2$  STT-MRAM Technology for LLC Application. *Sakhare, S.*, +, *TED Sept. 2020 3618-3625*

A Compact Model of Analog RRAM With Device and Array Nonideal Effects for Neuromorphic Systems. *Liao, Y.*, +, *TED April 2020 1593-1599*

An Improved RRAM-Based Binarized Neural Network With High Variation-Tolerated Forward/Backward Propagation Module. *Zhang, Y.*, +, *TED Feb. 2020 469-473*

Analysis of Program Disturbance Immunity of VA-SGLC Embedded Non-volatile Memory. *Park, S.*, +, *TED Oct. 2020 4534-4537*

Challenges and Trends in Developing Nonvolatile Memory-Enabled Computing Chips for Intelligent Edge Devices. *Hung, J.*, +, *TED April 2020 1444-1453*

Characterization and Modeling of Current Transport in Metal/Ferroelectric/Semiconductor Tunnel Junctions. *Franchini, G.*, +, *TED Sept. 2020 3729-3735*

Development of 2T-SONOS Cell Using a Contamination-Free Process Integration for a Highly Reliable Code Storage eNVM. *Park, S.*, +, *TED March 2020 922-928*

Drain-Erase Scheme in Ferroelectric Field Effect Transistor—Part II: 3-D-NAND Architecture for In-Memory Computing. *Wang, P.*, +, *TED March 2020 962-967*

Effects of CaO Interlayer on the Performance of Biodegradable Transient MgO-Based Resistive Random Access Memory. *Han, C.Y.*, +, *TED Feb. 2020 481-486*

Effects of Charge Quantity Induced by Different Forming Methods in Solid Electrolyte GeSO-Based Resistance Switching Device With Copper Electrode. *Chen, P.*, +, *TED June 2020 2324-2328*

FeCAM: A Universal Compact Digital and Analog Content Addressable Memory Using Ferroelectric. *Yin, X.*, +, *TED July 2020 2785-2792*

In-Memory Digital Comparator Based on a Single Multivalued One-Transistor-One-Resistor Memristor. *Cheng, L.*, +, *TED March 2020 1293-1296*

Investigating Ferroelectric Minor Loop Dynamics and History Effect—Part I: Device Characterization. *Wang, P.*, +, *TED Sept. 2020 3592-3597*

- Investigating Ferroelectric Minor Loop Dynamics and History Effect—Part II: Physical Modeling and Impact on Neural Network Training. *Wang, P.*, +, *TED Sept. 2020 3598-3604*
- Investigation of Accumulative Switching in Ferroelectric FETs: Enabling Universal Modeling of the Switching Behavior. *Mulaosmanovic, H.*, +, *TED Dec. 2020 5804-5809*
- Investigation of the Thermal Recovery From Reset Breakdown of a SiN<sub>x</sub>-Based RRAM. *Hong, K.*, +, *TED April 2020 1600-1605*
- Lower Power, Better Uniformity, and Stability CBRAM Enabled by Graphene Nanohole Interface Engineering. *Liu, Y.*, +, *TED March 2020 984-988*
- Mechanism for Unipolar Reset in Negative Thermophoresis Resistive Memory Devices. *Xu, X.*, +, *TED Dec. 2020 5815-5818*
- Mitigating the Passing Word Line Induced Soft Errors in Saddle Fin DRAM. *Gautam, S.K.*, +, *TED April 2020 1902-1905*
- Neuro-Inspired-in-Memory Computing Using Charge-Trapping MemTransistor on Germanium as Synaptic Device. *Chou, Y.*, +, *TED Sept. 2020 3605-3609*
- Non-Volatile Field-Effect Transistors Enabled by Oxygen Vacancy-Related Dipoles for Memory and Synapse Applications. *Peng, Y.*, +, *TED Sept. 2020 3632-3636*
- Operation Characteristics of Gate-All-Around Junctionless Flash Memory Devices With Si<sub>3</sub>N<sub>4</sub>/ZrO<sub>2</sub>-Based Stacked Trapping Layer. *Fang, H.*, +, *TED Sept. 2020 3626-3631*
- Programming-Pulse Dependence of Ferroelectric Partial Polarization: Insights From a Comparative Study of PZT and HZO Capacitors. *Pandey, P.*, +, *TED Oct. 2020 4482-4487*
- Promising Engineering Approaches for Improving the Reliability of HfZrO<sub>x</sub> 2-D and 3-D Ferroelectric Random Access Memories. *Lin, Y.*, +, *TED Dec. 2020 5479-5483*
- Scalability of Quad Interface p-MTJ for 1X nm STT-MRAM With 10-ns Low Power Write Operation, 10 Years Retention and Endurance > 10<sup>11</sup>. *Miura, S.*, +, *TED Dec. 2020 5368-5373*
- Semi-Empirical RC Circuit Model for Non-Filamentary Bi-Layer OxRAM Devices. *Majumdar, S.*, +, *TED March 2020 1348-1352*
- Simulations of Ultralow-Power Nonvolatile Cells for Random-Access Memory. *Lane, D.*, +, *TED Feb. 2020 474-480*
- The Past, the Present, and the Future of Ferroelectric Memories. *Mikolajick, T.*, +, *TED April 2020 1434-1443*
- Time Complexity of In-Memory Solution of Linear Systems. *Sun, Z.*, +, *TED July 2020 2945-2951*
- True Random Number Generation From Commodity NVM Chips. *Chakraborty, S.*, +, *TED March 2020 888-894*
- Ultrahigh-Density 3-D Vertical RRAM With Stacked Junctionless Nanowires for In-Memory-Computing Applications. *Ezzadeen, M.*, +, *TED Nov. 2020 4626-4630*
- Ultralow Current Switching in Flexible Hybrid PVP:MoS<sub>2</sub>/HfO<sub>x</sub> Bilayer Devices. *Varun, I.*, +, *TED Aug. 2020 3472-3477*
- Rapid prototyping (industrial)**
- Automated Mini-Platform With 3-D Printed Paper Microstrips for Image Processing-Based Viscosity Measurement of Biological Samples. *Puneeth, S.B.*, +, *TED June 2020 2559-2565*
- Rapid thermal annealing**
- Design and Fabrication Approaches of 400–600 V 4H-SiC Lateral MOSFETs for Emerging Power ICs Application. *Yun, N.*, +, *TED Nov. 2020 5005-5011*
- Fabrication and Performance of Ti/Al/Ni/TiN Au-Free Ohmic Contacts for Undoped AlGaIn/GaN HEMT. *Li, X.*, +, *TED May 2020 1959-1964*
- High-k Hf<sub>x</sub>Zr<sub>1-x</sub>O<sub>2</sub> Ferroelectric Insulator by Utilizing High Pressure Anneal. *Das, D.*, +, *TED June 2020 2489-2494*
- Improved TDDB Reliability and Interface States in 5-nm Hf<sub>0.5</sub>Zr<sub>0.5</sub>O<sub>2</sub> Ferroelectric Technologies Using NH<sub>3</sub> Plasma and Microwave Annealing. *Chen, Y.*, +, *TED April 2020 1581-1585*
- Process Variation Analysis of Device Performance Using Virtual Fabrication: Methodology Demonstrated on a CMOS 14-nm FinFET Vehicle. *Vincent, B.*, +, *TED Dec. 2020 5374-5380*
- Rapid thermal processing**
- A Highly Sensitive Ammonia (NH<sub>3</sub>) Sensor Based on a Tungsten Trioxide (WO<sub>3</sub>) Thin Film Decorated With Evaporated Platinum (Pt) Nanoparticles. *Chang, C.*, +, *TED March 2020 1176-1182*
- Ray tracing**
- A Simple Method to Realize Millilens Array on Encapsulant Layer for Enhancing Light Efficiency of COB-LEDs. *Yu, X.*, +, *TED Sept. 2020 3655-3659*
- Ring Remote Phosphor Structure for Laser-Driven White Lighting. *Chen, B.*, +, *TED June 2020 2400-2405*
- RC circuits**
- A New Method to Correlate Human Body Model and Transmission Line Pulse Based on RC Thermal Equivalent Model. *Wang, Y.*, +, *TED Sept. 2020 3775-3780*
- Semi-Empirical RC Circuit Model for Non-Filamentary Bi-Layer OxRAM Devices. *Majumdar, S.*, +, *TED March 2020 1348-1352*
- Reaction kinetics**
- Interfacial Resistance Characterization for Blade-Type Phase Change Random Access Memory. *Wen, J.*, +, *TED March 2020 968-975*
- Reaction-diffusion systems**
- A Stochastic Framework for the Time Kinetics of Interface and Bulk Oxide Traps for BTI, SILC, and TDDB in MOSFETs. *Kumar, S.*, +, *TED Nov. 2020 4741-4748*
- Recrystallization**
- Improvement of AlN Material Quality by High-Temperature Annealing Toward Power Diodes. *Ni, X.*, +, *TED Oct. 2020 3988-3991*
- Rectangular waveguides**
- H- and E-Plane Loaded Slow Wave Structure for W-Band TWT. *Billa, L.R.*, +, *TED Jan. 2020 309-313*
- Design of Thin Wire Metamaterial-Based Interaction Structure for Backward Wave Generation. *Narasimhan, P.*, +, *TED March 2020 1227-1233*
- Development of a Ka-Band Circular TM<sub>01</sub> to Rectangular TE<sub>10</sub> Mode Converter. *Chen, Q.*, +, *TED March 2020 1254-1258*
- Theoretical Analysis and PIC Simulation of a 140-GHz Double Confocal Waveguide Gyro-TWA. *Zhang, C.*, +, *TED Oct. 2020 4453-4459*
- Rectification**
- Band Alignment and Interface Recombination in NiO/β-Ga<sub>2</sub>O<sub>3</sub> Type-II p-n Heterojunctions. *Gong, H.*, +, *TED Aug. 2020 3341-3347*
- Characterization of Schottky Barrier Diodes on Heteroepitaxial Diamond on 3C-SiC/Si Substrates. *Murooka, T.*, +, *TED Jan. 2020 212-216*
- Effect of Different Metallic Contacts on the Device Performance of a p-n Heterostructure of a Topological Insulator and Silicon (p-Bi<sub>2</sub>Te<sub>3</sub>/n-Si). *Ahmad, F.*, +, *TED Dec. 2020 5388-5395*
- Improvement of the Deep UV Sensor Performance of a β-Ga<sub>2</sub>O<sub>3</sub> Photodiode by Coupling of Two Planar Diodes. *Vieira, D.H.*, +, *TED Nov. 2020 4947-4952*
- MgZnO-Based Schottky Barrier Ultraviolet-B Photodiode by Ultrasonic Spray Pyrolysis Deposition. *Liu, H.*, +, *TED Jan. 2020 173-178*
- Temperature-Dependent Electrical Properties of Graphitic Carbon Schottky Contacts to β-Ga<sub>2</sub>O<sub>3</sub>. *Tran, H.N.*, +, *TED Dec. 2020 5669-5675*
- Transport Mechanism of B/P Codoped Armchair Graphene Nanoribbons. *Liu, J.*, +, *TED May 2020 2120-2125*
- Rectifiers**
- An Inkjet-Printed Full-Wave Rectifier for Low-Voltage Operation Using Electrolyte-Gated Indium-Oxide Thin-Film Transistors. *Feng, X.*, +, *TED Nov. 2020 4918-4923*
- GaN Schottky Barrier Diode-Based Wideband and Medium-Power Microwave Rectifier for Wireless Power Transmission. *Li, Y.*, +, *TED Oct. 2020 4123-4129*
- Guiding Principles for Trench Schottky Barrier Diodes Based on Ultrawide Bandgap Semiconductors: A Case Study in Ga<sub>2</sub>O<sub>3</sub>. *Li, W.*, +, *TED Oct. 2020 3938-3947*
- Rectifying circuits**
- High-Frequency Rectifiers Based on Organic Thin-Film Transistors on Flexible Substrates. *Ibrahim, G.H.*, +, *TED June 2020 2365-2371*

**Reduction (chemical)**

Optimized Resistive Switching in TiO<sub>2</sub> Nanotubes by Modulation of Oxygen Vacancy Through Chemical Reduction. *Hazra, A.*, +, *TED May 2020 2197-2204*

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- High-Performance Solution-Processed Pentacene/Al Schottky Ultraviolet Photodiode With Pseudo Photovoltaic Effect. *Srivastava, A.*, +, *TED Oct. 2020 4300-4307*
- Impact of Implanted Edge Termination on Vertical  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> Schottky Barrier Diodes Under OFF-State Stressing. *Zhang, Y.*, +, *TED Oct. 2020 3948-3953*
- Improved the  $C$ - $V$  Curve Shift, Trap State Responsiveness, and Dynamic  $R_{ON}$  of SBDs by the Composite 2-D-3-D Channel Heterostructure Under the OFF-State Stress. *Yang, L.*, +, *TED Nov. 2020 4808-4812*
- Improvement of the Deep UV Sensor Performance of a  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> Photodiode by Coupling of Two Planar Diodes. *Vieira, D.H.*, +, *TED Nov. 2020 4947-4952*
- In Situ Observation of  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> Schottky Diode Failure Under Forward Biasing Condition. *Islam, Z.*, +, *TED Aug. 2020 3056-3061*
- Influence of Different Surface Morphologies on the Performance of High-Voltage, Low-Resistance Diamond Schottky Diodes. *Reinke, P.*, +, *TED June 2020 2471-2477*
- Investigating the Failure Mechanism of Short-Circuit Tests in 1.2-kV SiC JBS-Integrated MOSFETs. *Zhang, Y.*, +, *TED Oct. 2020 4027-4032*
- MgZnO-Based Schottky Barrier Ultraviolet-B Photodiode by Ultrasonic Spray Pyrolysis Deposition. *Liu, H.*, +, *TED Jan. 2020 173-178*
- Microcantilever Printed Back-to-Back ZnO Single-Nanowire Schottky Diodes. *Yadav, V.K.S.*, +, *TED Aug. 2020 3309-3314*
- Room Temperature Hydrogen Sensing Investigation of Zinc Oxide Schottky Thin-Film Transistors: Dependence on Film Thickness. *Ghosh, S.*, +, *TED Dec. 2020 5701-5709*
- Simulation Study of a Novel Snapback Free Reverse-Conducting SOI-LIGBT With Embedded P-Type Schottky Barrier Diode. *Yi, B.*, +, *TED May 2020 2058-2065*
- Temperature-Dependent Electrical Properties of Graphitic Carbon Schottky Contacts to  $\beta$ -Ga<sub>2</sub>O<sub>3</sub>. *Tran, H.N.*, +, *TED Dec. 2020 5669-5675*
- Schottky effect**
- Si Nanowire With Integrated Space-Charge- Limited Conducted Schottky Junction for Enhancing Field Electron Emission and Its Gated Devices. *Zeng, M.*, +, *TED Oct. 2020 4467-4472*
- Schottky gate field effect transistors**
- Cause and Effects of OFF-State Degradation in Hydrogen-Terminated Diamond MESFETs. *De Santi, C.*, +, *TED Oct. 2020 4021-4026*
- Diamond Field-Effect Transistors With V<sub>2</sub>O<sub>5</sub>-Induced Transfer Doping: Scaling to 50-nm Gate Length. *Crawford, K.G.*, +, *TED June 2020 2270-2275*
- Effect of Annealing Temperature on Performances of Boron-Doped Diamond Metal-Semiconductor Field-Effect Transistors. *Liu, J.*, +, *TED April 2020 1680-1685*
- Flexible Oxide-Based Schottky Neuromorphic TFTs With Configurable Spiking Dynamic Functions. *He, Y.*, +, *TED Nov. 2020 5216-5220*
- Impact of Gate-Source/Drain Underlap on the Performance of Monolayer SiC Schottky-Barrier Field-Effect Transistor. *Xie, H.*, +, *TED Oct. 2020 4130-4135*
- Improving Current ON/OFF Ratio and Subthreshold Swing of Schottky-Gate AlGaIn/GaN HEMTs by Postmetallization Annealing. *Lee, H.*, +, *TED July 2020 2760-2764*
- Schrodinger equation**
- A Comprehensive Analysis of the 2-DEG Transport Properties in In<sub>x</sub>Al<sub>1-x</sub>N/AlN/GaN Heterostructure: Experiments and Numerical Simulations. *Qin, J.*, +, *TED Dec. 2020 5427-5433*
- A Predictive 3-D Source/Drain Resistance Compact Model and the Impact on 7 nm and Scaled FinFETs. *Wu, T.*, +, *TED June 2020 2255-2262*
- Analytical Modeling of Short-Channel Effects in MFIS Negative-Capacitance FET Including Quantum Confinement Effects. *Pandey, N.*, +, *TED Nov. 2020 4757-4764*
- Charge-Based Compact Drain Current Modeling of InAs-OI-Si MOSFET Including Subband Energies and Band Nonparabolicity. *Maity, S.K.*, +, *TED June 2020 2282-2289*
- Monolayer MoSe<sub>2</sub>-Based Tunneling Field Effect Transistor for Ultrasensitive Strain Sensing. *Dubey, P.K.*, +, *TED May 2020 2140-2146*
- Seals (stoppers)**
- On-Chip Fully Integrated Field Emission Arrays for High-Voltage MEMS Applications. *Deka, N.*, +, *TED Sept. 2020 3753-3760*
- Secondary cells**
- Experimental Study of the Direct-Charge Beta Radiation Method for Energy Harvesting. *Haim, Y.*, +, *TED Nov. 2020 5076-5081*
- Secondary ion mass spectra**
- Degradation Mechanism of Ge N<sup>+</sup>-P Shallow Junction With Thin GeSn Surface Layer. *Tsui, B.*, +, *TED March 2020 1120-1125*
- Impact of Residual Carbon on Avalanche Voltage and Stability of Polarization-Induced Vertical GaN p-n Junction. *Fabris, E.*, +, *TED Oct. 2020 3978-3982*
- Investigation of DIBS-Deposited CdZnO/ZnO-Based Multiple Quantum Well for Large-Area Photovoltaic Application. *Siddharth, G.*, +, *TED Dec. 2020 5587-5592*
- Spatially Resolved Diffusion of Aluminum in 4H-SiC During Postimplantation Annealing. *Muting, J.*, +, *TED Oct. 2020 4360-4365*
- Secondary ion mass spectroscopy**
- Developing 13-kV 4H-SiC MOSFETs: Significance of Implant Straggle, Channel Design, and MOS Process on Static Performance. *Yun, N.*, +, *TED Oct. 2020 4346-4353*
- Seebeck effect**
- High-Temperature Thermoelectric Energy Conversion Devices Using Si-Ge Thick Films Prepared by Laser Sintering of Nano/Micro Particles. *Xie, K.*, +, *TED May 2020 2113-2119*
- The Demonstration of 3-D Bi<sub>2.0</sub>Te<sub>2.7</sub>Se<sub>0.3</sub>/Bi<sub>0.4</sub>Te<sub>3.0</sub>Sb<sub>1.6</sub> Thermoelectric Devices by Ionized Sputter System. *Liao, M.*, +, *TED Jan. 2020 406-408*
- Segregation**
- Effects of Annealing on the Behavior of Sn in GeSn Alloy and GeSn-Based Photodetectors. *Wang, L.*, +, *TED Aug. 2020 3229-3234*
- Selenium**
- Use of Pulse-Height Spectroscopy to Characterize the Hole Conduction Mechanism of a Polyimide Blocking Layer Used in Amorphous-Selenium Radiation Detectors. *Camlica, A.*, +, *TED Feb. 2020 633-639*
- Self-assembly**
- Effect of Self-Assembled Monolayers (SAMs) as Surface Passivation on the Flexible a-InSnZnO Thin-Film Transistors. *Zhong, W.*, +, *TED Aug. 2020 3157-3162*
- Low-Voltage IGZO TFTs Using Solution-Deposited OTS-Modified Ta<sub>2</sub>O<sub>5</sub> Dielectric. *Mohammadian, N.*, +, *TED April 2020 1625-1631*
- Si Nanowire With Integrated Space-Charge- Limited Conducted Schottky Junction for Enhancing Field Electron Emission and Its Gated Devices. *Zeng, M.*, +, *TED Oct. 2020 4467-4472*
- Semiconductor counters**
- Design and Simulation of 3-D CdTe Pillar Detectors. *Ellakany, A.*, +, *TED Dec. 2020 5564-5571*
- Fully Depleted MAPS in 110-nm CMOS Process With 100-300- $\mu$ m Active Substrate. *Pancheri, L.*, +, *TED June 2020 2393-2399*
- Use of Pulse-Height Spectroscopy to Characterize the Hole Conduction Mechanism of a Polyimide Blocking Layer Used in Amorphous-Selenium Radiation Detectors. *Camlica, A.*, +, *TED Feb. 2020 633-639*
- Semiconductor device breakdown**
- (Ultra)Wide-Bandgap Vertical Power FinFETs. *Zhang, Y.*, +, *TED Oct. 2020 3960-3971*



- 4H-SiC UMOSFET With an Electric Field Modulation Region Below P-Body. *Cheng, Y.*, +, *TED Aug. 2020 3298-3303*
- A First Evaluation of Thick Oxide 3C-SiC MOS Capacitors Reliability. *Li, F.*, +, *TED Jan. 2020 237-242*
- A Novel 3.3-kV Integrated ETO (IETO) With Single-Gate Controlling. *Chen, R.*, +, *TED May 2020 2052-2057*
- A Novel Double-RESURF SOI-LIGBT With Improved  $V_{ON}-E_{OFF}$  Tradeoff and Low Saturation Current. *Hu, H.*, +, *TED March 2020 1059-1065*
- A Novel Ultralow  $R_{ON,sp}$  Triple RESURF LDMOS With Sandwich n-p-n Layer. *Qiao, M.*, +, *TED Dec. 2020 5605-5612*
- A Stochastic Framework for the Time Kinetics of Interface and Bulk Oxide Traps for BTI, SILC, and TDD in MOSFETs. *Kumar, S.*, +, *TED Nov. 2020 4741-4748*
- A Trench-Field-Plate High-Voltage Power MOSFET. *Xiao, C.*, +, *TED June 2020 2482-2488*
- Accumulation-Mode Device: New Power MOSFET Breaking Superjunction Silicon Limit by Simulation Study. *Duan, B.*, +, *TED March 2020 1085-1089*
- Analysis of an AlGaIn/AlN Super-Lattice Buffer Concept for 650-V Low-Dispersion and High-Reliability GaN HEMTs. *Heuken, L.*, +, *TED March 2020 1113-1119*
- Analysis of DC, Channel Temperature, and RF Performance of *In Situ* SiN/AlGaIn-Sandwich-Barrier/GaN/Al<sub>0.05</sub>GaN HEMTs. *Yang, L.*, +, *TED Oct. 2020 4147-4151*
- Analysis of MIS-HEMT Device Edge Behavior for GaN Technology Using New Differential Method. *Kammeugne, R.K.*, +, *TED Nov. 2020 4649-4653*
- Application of 2DHG Diamond p-FET in Cascode With Normally-OFF Operation and a Breakdown Voltage of Over 1.7 kV. *Bi, T.*, +, *TED Oct. 2020 4006-4009*
- Breakdown Voltage Walk-in Phenomenon and Optimization for the Trench-Gate p-Type VDMOS Under Single Avalanche Stress. *Tong, X.*, +, *TED June 2020 2445-2450*
- Cause and Effects of OFF-State Degradation in Hydrogen-Terminated Diamond MESFETs. *De Santi, C.*, +, *TED Oct. 2020 4021-4026*
- Comparison of 2.3-kV 4H-SiC Accumulation-Channel Planar Power MOSFETs Fabricated With Linear, Square, Hexagonal, and Octagonal Cell Topologies. *Agarwal, A.*, +, *TED Sept. 2020 3673-3678*
- Deep-Recessed  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> Delta-Doped Field-Effect Transistors With *In Situ* Epitaxial Passivation. *Joishi, C.*, +, *TED Nov. 2020 4813-4819*
- Design and Fabrication Approaches of 400–600 V 4H-SiC Lateral MOSFETs for Emerging Power ICs Application. *Yun, N.*, +, *TED Nov. 2020 5005-5011*
- Design and Fabrication of Vertical GaN p-n Diode With Step-Etched Triple-Zone Junction Termination Extension. *Lee, H.*, +, *TED Sept. 2020 3553-3557*
- Design Guidelines and Performance Tradeoffs in Recessed AlGaIn/GaN Schottky Barrier Diodes. *Soni, A.*, +, *TED Nov. 2020 4834-4841*
- Design of a  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> Schottky Barrier Diode With p-Type III-Nitride Guard Ring for Enhanced Breakdown. *Roy, S.*, +, *TED Nov. 2020 4842-4848*
- Design Strategies for Mesa-Type GaN-Based Schottky Barrier Diodes for Obtaining High Breakdown Voltage and Low Leakage Current. *Jia, X.*, +, *TED May 2020 1931-1938*
- Diode-Less SiC Power Module With Countermeasures Against Bipolar Degradation to Achieve Ultrahigh Power Density. *Ishigaki, T.*, +, *TED May 2020 2035-2043*
- Distinct Failure Modes of AlGaIn/GaN HEMTs Under ESD Conditions. *Shankar, B.*, +, *TED April 2020 1567-1574*
- Edge Termination for III-Nitride Vertical Power Devices Using Polarization Engineering. *Peart, M.R.*, +, *TED Feb. 2020 571-575*
- Edge Termination With Enhanced Field-Limiting Rings Insensitive to Surface Charge for High-Voltage SiC Power Devices. *Hirao, T.*, +, *TED July 2020 2850-2853*
- Effects of Interface Traps and Self-Heating on the Performance of GAA GaN Vertical Nanowire MOSFET. *Thingujam, T.*, +, *TED March 2020 816-821*
- Experimental Characterization of Charge Trapping Dynamics in 100-nm AlN/GaN/AlGaIn-on-Si HEMTs by Wideband Transient Measurements. *Angelotti, A.M.*, +, *TED Aug. 2020 3069-3074*
- Experimental Determination of Impact Ionization Coefficients Along  $\langle 1120 \rangle$  in 4H-SiC. *Stefanakis, D.*, +, *TED Sept. 2020 3740-3744*
- Gate Leakage Suppression and Breakdown Voltage Enhancement in p-GaN HEMTs Using Metal/Graphene Gates. *Zhou, G.*, +, *TED March 2020 875-880*
- Guiding Principles for Trench Schottky Barrier Diodes Based on Ultrawide Bandgap Semiconductors: A Case Study in Ga<sub>2</sub>O<sub>3</sub>. *Li, W.*, +, *TED Oct. 2020 3938-3947*
- High-Performance Normally-OFF AlGaIn/GaN Fin-MISHEMT on Silicon With Low Work Function Metal-Source Contact Ledge. *Huang, Y.*, +, *TED Dec. 2020 5434-5440*
- High-Voltage Drain-Extended FinFET With a High- $k$  Dielectric Field Plate. *Kim, H.*, +, *TED March 2020 1077-1084*
- Hole-Induced Degradation in E-Mode GaN MIS-FETs: Impact of Substrate Terminations. *Hua, M.*, +, *TED Jan. 2020 217-223*
- Impact of Implanted Edge Termination on Vertical  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> Schottky Barrier Diodes Under OFF-State Stressing. *Zhang, Y.*, +, *TED Oct. 2020 3948-3953*
- Impact of Residual Carbon on Avalanche Voltage and Stability of Polarization-Induced Vertical GaN p-n Junction. *Fabris, E.*, +, *TED Oct. 2020 3978-3982*
- Impact of Varied Buffer Layer Designs on Single-Event Response of 1.2-kV SiC Power MOSFETs. *Lu, J.*, +, *TED Sept. 2020 3698-3704*
- Impacts of Stress Voltage and Channel Length on Hot-Carrier Characteristics of Tunnel Field-Effect Thin-Film Transistor. *Ma, W.C.*, +, *TED Nov. 2020 5243-5246*
- Improvement of Electron Transport Property and on-Resistance in Normally-OFF Al<sub>2</sub>O<sub>3</sub>/AlGaIn/GaN MOS-HEMTs Using Post-Etch Surface Treatment. *Zhu, J.*, +, *TED Sept. 2020 3541-3547*
- Influence of Different Surface Morphologies on the Performance of High-Voltage, Low-Resistance Diamond Schottky Diodes. *Reinke, P.*, +, *TED June 2020 2471-2477*
- Investigation of the Temperature Dependence of Hot-Carrier Degradation in Si MOSFETs Using Spectroscopic Charge Pumping. *Ruch, B.*, +, *TED Oct. 2020 4092-4098*
- Investigation of Wide- and Ultrawide-Bandgap Semiconductors From Impact-Ionization Coefficients. *Nouketcha, F.L.L.*, +, *TED Oct. 2020 3999-4005*
- Low-Frequency Noise Characteristics Under the OFF-State Stress. *Lee, G.*, +, *TED Oct. 2020 4366-4371*
- New Strained LDMOS With Ultralow ON-Resistance by Si<sub>1-y</sub>C<sub>y</sub> Source Stressor for About 20 V Low-Voltage Applications. *Li, M.*, +, *TED Nov. 2020 4998-5004*
- Novel Drain-Connected Field Plate GaN HEMT Designs for Improved  $V_{BD}-R_{ON}$  Tradeoff and RF PA Performance. *Soni, A.*, +, *TED April 2020 1718-1725*
- Numerical Solutions for Electric Field Lines and Breakdown Voltages in Superjunction-Like Power Devices. *Huang, H.*, +, *TED Sept. 2020 3898-3902*
- On the Trap Locations in Bulk FinFETs After Hot Carrier Degradation (HCD). *Yu, Z.*, +, *TED July 2020 3005-3009*
- Physical Insights Into the ESD Behavior of Drain Extended FinFETs (DeFinFETs) and Unique Current Filament Dynamics. *Kumar, B.S.*, +, *TED July 2020 2717-2724*
- Quick Design of a Superjunction Considering Charge Imbalance Due to Process Variations. *Akshay, K.*, +, *TED Aug. 2020 3024-3029*
- RESURF n-LDMOS Transistor for Advanced Integrated Circuits in 4H-SiC. *WeiBe, J.*, +, *TED Aug. 2020 3278-3284*
- Simulation Study on the Optimization and Scaling Behavior of LDMOS Transistors for Low-Voltage Power Applications. *Saadat, A.*, +, *TED Nov. 2020 4990-4997*
- Temperature Dependence of Conductivity Modulation in SiC Bipolar Junction Transistors. *Asada, S.*, +, *TED April 2020 1699-1704*

- The Effects of Gate-Connected Field Plates on Hotspot Temperatures of AlGaIn/GaN HEMTs. *Dundar, C.*, +, *TED Jan. 2020 57-62*
- The New Structure and Analytical Model of a High-Voltage Interconnection Shielding Structure With High- $k$  Dielectric Pillar. *Du, L.*, +, *TED April 2020 1745-1750*
- Theoretical Analysis of ON-State Performance Limit of 4H-SiC IGBT in Field-Stop Technology. *Luo, P.*, +, *TED Dec. 2020 5621-5627*
- Understanding Short-Circuit Failure Mechanism of Double-Trench SiC Power MOSFETs. *Wei, J.*, +, *TED Dec. 2020 5593-5599*
- Semiconductor device doping**
- Corrections to “Optimization and Scaling of Ge-Pocket TFET” [Dec 18 5289-5294]. *Li, W.*, *TED March 2020 1361*
- Semiconductor device manufacture**
- A Trench-Field-Plate High-Voltage Power MOSFET. *Xiao, C.*, +, *TED June 2020 2482-2488*
- AC-SSRM 2-D Cross-Sectional Doping Profiling for DRAM Access Devices Contact Implants. *Qin, S.*, *TED Nov. 2020 5028-5032*
- Achieving High Mobility and Excellent Stability in Amorphous In–Ga–Zn–Sn–O Thin-Film Transistors. *Choi, I.M.*, +, *TED March 2020 1014-1020*
- Charge-Based Model for the Drain-Current Variability in Organic Thin-Film Transistors Due to Carrier-Number and Correlated-Mobility Fluctuation. *Nikolaou, A.*, +, *TED Nov. 2020 4667-4671*
- Curing of Aged Gate Dielectric by the Self-Heating Effect in MOSFETs. *Park, J.*, +, *TED March 2020 777-788*
- Process Variation Analysis of Device Performance Using Virtual Fabrication: Methodology Demonstrated on a CMOS 14-nm FinFET Vehicle. *Vincent, B.*, +, *TED Dec. 2020 5374-5380*
- Semiconductor device measurement**
- A Drain–Source Connection Technique: Thermal Resistance Measurement Method for GaN HEMTs Using TSEP at High Voltage. *Li, X.*, +, *TED Dec. 2020 5454-5459*
- A New Technique for Mobility Extraction in MOSFETs in the Presence of Prominent Gate Oxide Trapping: Application to InGaAs MOSFETs. *Cai, X.*, +, *TED Aug. 2020 3075-3081*
- Diamond Field-Effect Transistors With  $V_2O_5$ -Induced Transfer Doping: Scaling to 50-nm Gate Length. *Crawford, K.G.*, +, *TED June 2020 2270-2275*
- Elucidation of Inhomogeneous Heterojunction Performance of Al/Cu<sub>5</sub>FeS<sub>4</sub> Schottky Diode With a Gaussian Distribution of Barrier Heights. *Sil, S.*, +, *TED May 2020 2082-2087*
- Experimental Characterization of Charge Trapping Dynamics in 100-nm AlN/GaN/AlGaIn-on-Si HEMTs by Wideband Transient Measurements. *Angelotti, A.M.*, +, *TED Aug. 2020 3069-3074*
- Geometric Modeling of Thermal Resistance in GaN HEMTs on Silicon. *Gonzalez, B.*, +, *TED Dec. 2020 5408-5414*
- Impact of Film Stress of Field-Plate Dielectric on Electric Characteristics of GaN-HEMTs. *Ando, Y.*, +, *TED Dec. 2020 5421-5426*
- Improving Current ON/OFF Ratio and Subthreshold Swing of Schottky-Gate AlGaIn/GaN HEMTs by Postmetallization Annealing. *Lee, H.*, +, *TED July 2020 2760-2764*
- Influence of Metal Gate Electrodes on Electrical Properties of Atomic-Layer-Deposited Al-Rich HfAlO/Ga<sub>2</sub>O<sub>3</sub> MOSCAPs. *Zhang, H.*, +, *TED April 2020 1730-1736*
- Low-Frequency Noise Investigation of GaN/AlGaIn Metal–Oxide–Semiconductor High-Electron-Mobility Field-Effect Transistor With Different Gate Length and Orientation. *Takakura, K.*, +, *TED Aug. 2020 3062-3068*
- Measuring Thermal Resistance of GaN HEMTs Using Modulation Method. *Smirnov, V.I.*, +, *TED Oct. 2020 4112-4117*
- RESURF n-LDMOS Transistor for Advanced Integrated Circuits in 4H-SiC. *WeiBe, J.*, +, *TED Aug. 2020 3278-3284*
- Short-Pulse Properties of the Gunn Diode. *Semyonov, E.V.*, +, *TED May 2020 2100-2105*
- Suppression of Edge Effect Induced by Positive Gate Bias Stress in Low-Temperature Polycrystalline Silicon TFTs With Channel Width Extension Over Source/Drain Regions. *Wang, Y.*, +, *TED Dec. 2020 5552-5556*
- Semiconductor device metallization**
- Improving Current ON/OFF Ratio and Subthreshold Swing of Schottky-Gate AlGaIn/GaN HEMTs by Postmetallization Annealing. *Lee, H.*, +, *TED July 2020 2760-2764*
- Optimization of Ohmic Contact for AlGaIn/GaN HEMT on Low-Resistivity Silicon. *Benakaprasad, B.*, +, *TED March 2020 863-868*
- Refractory W Ohmic Contacts to H-Terminated Diamond. *Vardi, A.*, +, *TED Sept. 2020 3516-3521*
- Semiconductor device models**
- 4H-SiC UMOFET With an Electric Field Modulation Region Below P-Body. *Cheng, Y.*, +, *TED Aug. 2020 3298-3303*
- A Compact Current–Voltage Model for 2-D-Semiconductor-Based Lateral Homo-/Hetero-Junction Tunnel-FETs. *Pal, A.*, +, *TED Oct. 2020 4473-4481*
- A Compact Model of Analog RRAM With Device and Array Nonideal Effects for Neuromorphic Systems. *Liao, Y.*, +, *TED April 2020 1593-1599*
- A Comprehensive Investigation on Short-Circuit Oscillation of p-GaN HEMTs. *Xue, P.*, +, *TED Nov. 2020 4849-4857*
- A Comprehensive Physics-Based Current–Voltage SPICE Compact Model for 2-D-Material-Based Top-Contact Bottom-Gated Schottky-Barrier FETs. *Ahsan, S.A.*, +, *TED Nov. 2020 5188-5195*
- A Drain–Source Connection Technique: Thermal Resistance Measurement Method for GaN HEMTs Using TSEP at High Voltage. *Li, X.*, +, *TED Dec. 2020 5454-5459*
- A First Evaluation of Thick Oxide 3C-SiC MOS Capacitors Reliability. *Li, F.*, +, *TED Jan. 2020 237-242*
- A Method for Series-Resistance-Immune Extraction of Low-Frequency Noise Parameters in Nanoscale MOSFETs. *Tataridou, A.*, +, *TED Nov. 2020 4568-4572*
- A Novel Diode-Clamped Carrier Stored Trench IGBT With Improved Performances. *Yi, B.*, +, *TED Jan. 2020 243-248*
- A Novel Double-RESURF SOI-LIGBT With Improved  $V_{ON}$ - $E_{OFF}$  Tradeoff and Low Saturation Current. *Hu, H.*, +, *TED March 2020 1059-1065*
- A Novel IGBT With High- $k$  Dielectric Modulation Achieving Ultralow Turn-Off Loss. *Chen, W.*, +, *TED March 2020 1066-1070*
- A Novel Self-Controlled Double Trench Gate Snapback Free Reverse-Conducting IGBT With a Built-in Trench Barrier Diode. *Liu, Z.*, +, *TED April 2020 1705-1711*
- A Novel Ultralow  $R_{ON,SP}$  Triple RESURF LDMOS With Sandwich n-p-n Layer. *Qiao, M.*, +, *TED Dec. 2020 5605-5612*
- A Parametric Technique for Trap Characterization in AlGaIn/GaN HEMTs. *Duffy, S.J.*, +, *TED May 2020 1924-1930*
- A Physical-Based Analytical Model for the Kink Current of Polycrystalline Silicon TFTs. *Chen, Y.*, +, *TED June 2020 2359-2364*
- A Physics-Based Compact Model for Ultrathin Black Phosphorus FETs—Part I: Effect of Contacts, Temperature, Ambipolarity, and Traps. *Yar-moghaddam, E.*, +, *TED Jan. 2020 389-396*
- A Physics-Based Compact Model for Ultrathin Black Phosphorus FETs—Part II: Model Validation Against Numerical and Experimental Data. *Yar-moghaddam, E.*, +, *TED Jan. 2020 397-405*
- A Predictive 3-D Source/Drain Resistance Compact Model and the Impact on 7 nm and Scaled FinFETs. *Wu, T.*, +, *TED June 2020 2255-2262*
- A Review of Hot Carrier Degradation in n-Channel MOSFETs—Part II: Technology Scaling. *Mahapatra, S.*, +, *TED July 2020 2672-2681*
- A Theoretical Study of Multidomain Ferroelectric Switching Dynamics With a Physics-Based SPICE Circuit Model for Phase-Field Simulations. *Hsu, C.*, +, *TED July 2020 2952-2959*
- A Trench-Field-Plate High-Voltage Power MOSFET. *Xiao, C.*, +, *TED June 2020 2482-2488*
- A Vertical Combo Spacer to Optimize Electrothermal Characteristics of 7-nm Nanosheet Gate-All-Around Transistor. *Liu, R.*, +, *TED June 2020 2249-2254*
- Abnormal Hump Effect Induced by Hydrogen Diffusion During Self-Heating Stress in Top-Gate Amorphous InGaZnO TFTs. *Chen, H.*, +, *TED July 2020 2807-2811*
- Accurate Computation of IGBT Junction Temperature in PLECS. *Gorecki, P.*, +, *TED July 2020 2865-2871*

- Accurate Temperature Estimation for Each Gate of GaN HEMT With n-Gate Fingers. *Al-Saman, A.A.*, +, *TED Sept. 2020 3577-3584*
- Alternated Trench-Gate IGBT for Low Loss and Suppressing Negative Gate Capacitance. *Saito, W.*, +, *TED Aug. 2020 3285-3290*
- An Efficient Thermal Model for Multifinger SiGe HBTs Under Real Operating Condition. *Nidhin, K.*, +, *TED Nov. 2020 5069-5075*
- An Improved Behavior Model for IGBT Modules Driven by Datasheet and Measurement. *Jing, L.*, +, *TED Jan. 2020 230-236*
- An Improved Silicon-Controlled Rectifier (SCR) for Low-Voltage ESD Application. *Du, F.*, +, *TED Feb. 2020 576-581*
- An Iterative Surface Potential Algorithm Including Interface Traps for Compact Modeling of SiC-MOSFETs. *Albrecht, M.*, +, *TED March 2020 855-862*
- An ON-Resistance Model for Silicon Carbide Merged p-i-n Schottky (MPS) Diodes. *Du, Q.*, +, *TED Oct. 2020 4033-4039*
- Analysis and Modeling of Polarization Gradient Effect on Negative Capacitance FET. *Kao, M.*, +, *TED Oct. 2020 4521-4525*
- Analysis of DC, Channel Temperature, and RF Performance of *In Situ* SiN/AlGaIn-Sandwich-Barrier/GaN/Al<sub>0.05</sub>GaN HEMTs. *Yang, L.*, +, *TED Oct. 2020 4147-4151*
- Analysis of MIS-HEMT Device Edge Behavior for GaN Technology Using New Differential Method. *Kammeugne, R.K.*, +, *TED Nov. 2020 4649-4653*
- Analysis of Surface Charge Effects and Edge Fringing Capacitance in Planar GaAs and GaN Schottky Barrier Diodes. *Orfao, B.*, +, *TED Sept. 2020 3530-3535*
- Analytical Current–Voltage Model for Double-Gate a-IGZO TFTs With Symmetric Structure for Above Threshold. *Hernandez-Barrios, Y.*, +, *TED May 2020 1980-1986*
- Analytical Drain Current and Capacitance Model for Amorphous InGaZnO TFTs Considering Temperature Characteristics. *He, H.*, +, *TED Sept. 2020 3637-3644*
- Analytical Model Developed for Precise Stress Estimation of Device Channel Within Advanced Planar MOSFET Architectures. *Lee, C.*, +, *TED April 2020 1498-1505*
- Analytical Model for Interface Traps-Dependent Back Bias Capability and Variability in Ultrathin Body and Box FDSOI MOSFETs. *Chen, W.*, +, *TED Nov. 2020 4573-4577*
- Analytical Model for Low-Frequency Noise in Junctionless Nanowire Transistors. *Trevisoli, R.*, +, *TED June 2020 2536-2543*
- Analytical Modeling of Double-Gate and Nanowire Junctionless ISFETs. *Yesayan, A.*, +, *TED March 2020 1157-1164*
- Analytical Modeling of Short-Channel Effects in MFIS Negative-Capacitance FET Including Quantum Confinement Effects. *Pandey, N.*, +, *TED Nov. 2020 4757-4764*
- Armchair Graphene Nanoribbon Gate-Controllable RTD With Boron Nitride Barriers. *Monfared, M.H.G.*, +, *TED Nov. 2020 5209-5215*
- Assessing the Performance of Novel Two-Dimensional Materials Transistors: First-Principles Based Approach. *Kim, B.*, +, *TED Feb. 2020 463-468*
- Assessing the Role of a Semiconductor's Anisotropic Permittivity in Hafnium Disulfide Monolayer Field-Effect Transistors. *Bennett, R.K.A.*, +, *TED June 2020 2607-2613*
- Augmentation and Assessment of a Universal FET  $I-V$  Model for Simulating GaN HEMTs. *Dasari, P.*, +, *TED March 2020 847-854*
- Batch-Fabricated WSe<sub>2</sub>-on-Sapphire Field-Effect Transistors Grown by Chemical Vapor Deposition. *Asghari Heidarlou, M.*, +, *TED April 2020 1839-1844*
- Bias Stress Instability in Multilayered MoS<sub>2</sub> Field-Effect Transistors Under Pulse-Mode Operation. *Seo, S.G.*, +, *TED April 2020 1864-1872*
- Bias-Dependent Electron Velocity Extracted From N-Polar GaN Deep Recess HEMTs. *Romanczyk, B.*, +, *TED April 2020 1542-1546*
- Bipolar AC (Bipac) Switch With Buried Layer for Specific AC Mains Applications. *Rizk, H.*, +, *TED June 2020 2451-2456*
- BSIM Compact Model of Quantum Confinement in Advanced Nanosheet FETs. *Dasgupta, A.*, +, *TED Feb. 2020 730-737*
- Characterization and Modeling of Hot Carrier Degradation in N-Channel Gate-All-Around Nanowire FETs. *Gupta, C.*, +, *TED Jan. 2020 4-10*
- Characterization and TCAD Modeling of Mixed-Mode Stress Induced by Impact Ionization in Scaled SiGe HBTs. *Zagni, N.*, +, *TED Nov. 2020 4597-4601*
- Charge Transport in Vertical GaN Schottky Barrier Diodes: A Refined Physical Model for Conductive Dislocations. *Chen, L.*, +, *TED March 2020 841-846*
- Charge-Based Compact Drain Current Modeling of InAs-OI-Si MOSFET Including Subband Energies and Band Nonparabolicity. *Maity, S.K.*, +, *TED June 2020 2282-2289*
- Charge-Based Compact Model of Gate Leakage Current for AlInN/GaN and AlGaIn/GaN HEMTs. *Debnath, A.*, +, *TED March 2020 834-840*
- Charge-Based Model for the Drain-Current Variability in Organic Thin-Film Transistors Due to Carrier-Number and Correlated-Mobility Fluctuation. *Nikolaou, A.*, +, *TED Nov. 2020 4667-4671*
- Comments on “An Analytical Surface Potential Model Accounting for the Dual-Modulation Effects in Tunnel FETs”. *Shaker, A.*, *TED July 2020 3014-3015*
- Compact Modeling of Negative-Capacitance FDSOI FETs for Circuit Simulations. *Dabhi, C.K.*, +, *TED July 2020 2710-2716*
- Compact Modeling of Short-Channel Effects in Staggered Organic Thin-Film Transistors. *Pruefer, J.*, +, *TED Nov. 2020 5082-5090*
- Comparative Analysis of Hot Carrier Degradation (HCD) in 10-nm Node nMOS/pMOS FinFET Devices. *Kim, J.*, +, *TED Dec. 2020 5396-5402*
- Comparative Analysis of IGBT Parameters Variation Under Different Accelerated Aging Tests. *Mohamed Sathik, M.H.*, +, *TED March 2020 1098-1105*
- Computational Study of p-n Carbon Nanotube Tunnel Field-Effect Transistor. *Tamersit, K.*, *TED Feb. 2020 704-710*
- Consistent Surface-Potential-Based Modeling of Drain and Gate Currents in AlGaIn/GaN HEMTs. *Albahrani, S.A.*, +, *TED Feb. 2020 455-462*
- Controlling the Effective Channel Thickness of Junctionless Transistors by Substrate Bias. *Jeon, D.*, +, *TED Nov. 2020 4736-4740*
- Deep-Recessed  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> Delta-Doped Field-Effect Transistors With *In Situ* Epitaxial Passivation. *Joishi, C.*, +, *TED Nov. 2020 4813-4819*
- Density-of-States-Based Physical Model for Ink-Jet Printed Thiophene Polymeric TFTs. *Lee, J.*, +, *TED Jan. 2020 283-288*
- Design and Fabrication Approaches of 400–600 V 4H-SiC Lateral MOSFETs for Emerging Power ICs Application. *Yun, N.*, +, *TED Nov. 2020 5005-5011*
- Design and Investigation of Split-Gate MoTe<sub>2</sub>-Based FET as Single Transistor AND Gate Using Nonequilibrium Green's Function. *Kumar, P.*, +, *TED Nov. 2020 5221-5228*
- Design and Simulation of Steep-Slope Silicon Cold Source FETs With Effective Carrier Distribution Model. *Gan, W.*, +, *TED June 2020 2243-2248*
- Design Considerations for Si- and Ge-Stacked Nanosheet pMOSFETs Based on Quantum Transport Simulations. *Zhang, S.*, +, *TED Jan. 2020 26-32*
- Design of a  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> Schottky Barrier Diode With p-Type III-Nitride Guard Ring for Enhanced Breakdown. *Roy, S.*, +, *TED Nov. 2020 4842-4848*
- Design of On-Wafer TRL Calibration Kit for InP Technologies Characterization up to 500 GHz. *Deng, M.*, +, *TED Dec. 2020 5441-5447*
- Design Optimization Techniques in Nanosheet Transistor for RF Applications. *Kushwaha, P.*, +, *TED Oct. 2020 4515-4520*
- Designing Beveled Edge Termination in GaN Vertical p-i-n Diode-Bevel Angle, Doping, and Passivation. *Zeng, K.*, +, *TED June 2020 2457-2462*
- Developing 13-kV 4H-SiC MOSFETs: Significance of Implant Straggle, Channel Design, and MOS Process on Static Performance. *Yun, N.*, +, *TED Oct. 2020 4346-4353*
- Device and Circuit-Level Assessment of GaSb/Si Heterojunction Vertical Tunnel-FET for Low-Power Applications. *Tripathy, M.R.*, +, *TED March 2020 1285-1292*
- Distinct Failure Modes of AlGaIn/GaN HEMTs Under ESD Conditions. *Shankar, B.*, +, *TED April 2020 1567-1574*
- Double-Gate Field-Effect Diode: A Novel Device for Improving Digital-and-Analog Performance. *Hashemi, S.A.*, +, *TED Jan. 2020 18-25*
- Drain-Erase Scheme in Ferroelectric Field Effect Transistor—Part II: 3-D-NAND Architecture for In-Memory Computing. *Wang, P.*, +, *TED March 2020 962-967*



- Dynamic  $C_{GD}$  and  $dV/dt$  in Superjunction MOSFETs. Kang, H., +, *TED April 2020 1523-1529*
- Edge Termination for III-Nitride Vertical Power Devices Using Polarization Engineering. Peart, M.R., +, *TED Feb. 2020 571-575*
- Effect of Charge Partitioning on IM3 Prediction in SOI-LDMOS Transistors. Gupta, S., +, *TED Feb. 2020 606-613*
- Effect of Two-Step Annealing on High Stability of a-IGZO Thin-Film Transistor. Peng, C., +, *TED Oct. 2020 4262-4268*
- Effects of Interface Traps and Self-Heating on the Performance of GAA GaN Vertical Nanowire MOSFET. Thingujam, T., +, *TED March 2020 816-821*
- Effects of Redundant Electrode Width on Stability of a-InGaZnO Thin-Film Transistors Under Hot-Carrier Stress. Lin, D., +, *TED June 2020 2372-2375*
- Effects of Self-Heating on  $f_T$  and  $f_{max}$  Performance of Graphene Field-Effect Transistors. Bonmann, M., +, *TED March 2020 1277-1284*
- Efficiency Enhancement of Perovskite Solar Cells Using Heterojunction Bipolar Transistor Configuration. Wahid, S., +, *TED Feb. 2020 552-557*
- Electrical Compact Modeling of SiGe Phototransistor: Impact of the Distributed Nature on Dynamic Behavior. Bennour, A., +, *TED March 2020 1034-1040*
- Electrical Properties of  $Al_2O_3/ZnO$  Metal-Insulator-Semiconductor Capacitors. Zhang, Q., +, *TED Nov. 2020 5033-5038*
- Electro-Thermo-Mechanical Reliability of Recessed Barrier AlGaIn/GaN Schottky Diodes Under Pulse Switching Conditions. Shankar, B., +, *TED May 2020 2044-2051*
- Engineering Schemes for Bulk FinFET to Simultaneously Improve ESD/Latch-Up Behavior and Hot Carrier Reliability. Paul, M., +, *TED July 2020 2745-2751*
- Enhancement of Hot Spot Cooling by Capped Diamond Layer Deposition for Multifinger AlGaIn/GaN HEMTs. Zhang, H., +, *TED Jan. 2020 47-52*
- Equivalent DG Dimensions Concept for Compact Modeling of Short-Channel and Thin Body GAA MOSFETs Including Quantum Confinement. Yilmaz, K., +, *TED Dec. 2020 5381-5387*
- Evaluation of Dynamic Avalanche Performance in 1.2-kV MOS-Bipolar Devices. Luo, P., +, *TED Sept. 2020 3691-3697*
- Experimental Details of a Steep-Slope Ferroelectric InGaAs Tunnel-FET With High-Quality PZT and Modeling Insights in the Transient Polarization. Verhulst, A.S., +, *TED Jan. 2020 377-382*
- Experimental Observation and Modeling of the Impact of Traps on Static and Analog/HF Performance of Graphene Transistors. Pacheco-Sanchez, A., +, *TED Dec. 2020 5790-5796*
- Exploration of Negative Capacitance in Gate-All-Around Si Nanosheet Transistors. Sakib, F.I., +, *TED Nov. 2020 5236-5242*
- Extraction of the 4H-SiC/SiO<sub>2</sub> Barrier Height Over Temperature. Avino-Salvado, O., +, *TED Jan. 2020 63-68*
- Extreme Temperature Modeling of AlGaIn/GaN HEMTs. Albahrani, S.A., +, *TED Feb. 2020 430-437*
- Free Carrier Mobility, Series Resistance, and Threshold Voltage Extraction in Junction FETs. Makris, N., +, *TED Nov. 2020 4658-4661*
- Frequency-Improved 4H-SiC IGBT With Multizone Collector Design. Tang, G., +, *TED Jan. 2020 198-203*
- Full-Band Quantum Transport of Heterojunction Electron Devices With Empirical Pseudopotentials. M'foukh, A., +, *TED Dec. 2020 5662-5668*
- Fundamental Aspects of Semiconductor Device Modeling Associated With Discrete Impurities: Drift-Diffusion Simulation Scheme. Sano, N., +, *TED Aug. 2020 3323-3328*
- Gate-Induced Drain Leakage in Negative Capacitance FinFETs. Gaidhane, A.D., +, *TED March 2020 802-809*
- Ge-GaAs-Ge Heterojunction MOSFETs for Mixed-Signal Applications. Mech, B.C., +, *TED Sept. 2020 3585-3591*
- Geometric Modeling of Thermal Resistance in GaN HEMTs on Silicon. Gonzalez, B., +, *TED Dec. 2020 5408-5414*
- High-Frequency Switching Properties and Low Oxide Electric Field and Energy Loss in a Reverse-Channel 4H-SiC UMOFET. Shen, Z., +, *TED Oct. 2020 4046-4053*
- Highly Tunable High- $Q$  Inversion-Mode MOS Varactor in the 1–325-GHz Band. Margalef-Rovira, M., +, *TED June 2020 2263-2269*
- Hot Carrier Effect in Self-Aligned In-Ga-Zn-O Thin-Film Transistors With Short Channel Length. On, N., +, *TED Dec. 2020 5544-5551*
- Hot-Electron Effects in AlGaIn/GaN HEMTs Under Semi-ON DC Stress. Minetto, A., +, *TED Nov. 2020 4602-4605*
- Hydrogen Diffusion and Threshold Voltage Shifts in Top-Gate Amorphous InGaZnO Thin-Film Transistors. Chen, H., +, *TED Aug. 2020 3123-3128*
- Impact of AlInN Back-Barrier Over AlGaIn/GaN MOS-HEMT With HfO<sub>2</sub> Dielectric Using Cubic Spline Interpolation Technique. Sandeep, V., +, *TED Sept. 2020 3558-3563*
- Impact of Body Thickness and Scattering on III-V Triple Heterojunction TFET Modeled With Atomistic Mode-Space Approximation. Chen, C., +, *TED Aug. 2020 3478-3485*
- Impact of Charges at Ferroelectric/Interlayer Interface on Depolarization Field of Ferroelectric FET With Metal/Ferroelectric/Interlayer/Si Gate-Stack. Wang, X., +, *TED Oct. 2020 4500-4506*
- Impact of Gate Size on Abnormal Current Rise Under an Electric Field in Organic Thin-Film Transistors. Chen, H., +, *TED March 2020 1143-1148*
- Impact of Gate-Source/Drain Underlap on the Performance of Monolayer SiC Schottky-Barrier Field-Effect Transistor. Xie, H., +, *TED Oct. 2020 4130-4135*
- Impact of Hot Carrier Aging on the Performance of Triple-Gate Junctionless MOSFETs. Oproglidis, T.A., +, *TED Feb. 2020 424-429*
- Impact of Hot-Carrier Degradation on Drain-Induced Barrier Lowering in Multifin SOI n-Channel FinFETs With Self-Heating. Gupta, C., +, *TED May 2020 2208-2212*
- Impact of Switching Voltage on Complementary Steep-Slope Tunnel Field Effect Transistor Circuits. Kato, K., +, *TED Sept. 2020 3876-3882*
- Improved  $T_{MAX}$  Estimation in GaN HEMTs Using an Equivalent Hot Point Approximation. Odabasi, O., +, *TED April 2020 1553-1559*
- Inflection Phenomenon in Cryogenic MOSFET Behavior. Beckers, A., +, *TED March 2020 1357-1360*
- Insight into Buffer Trap-Induced Current Saturation and Current Collapse in GaN RF Heterojunction Field-Effect Transistors. Tripathi, D.C., +, *TED Dec. 2020 5460-5465*
- Investigating Ferroelectric Minor Loop Dynamics and History Effect—Part I: Device Characterization. Wang, P., +, *TED Sept. 2020 3592-3597*
- Investigating Ferroelectric Minor Loop Dynamics and History Effect—Part II: Physical Modeling and Impact on Neural Network Training. Wang, P., +, *TED Sept. 2020 3598-3604*
- Investigating the Failure Mechanism of Short-Circuit Tests in 1.2-kV SiC JBS-Integrated MOSFETs. Zhang, Y., +, *TED Oct. 2020 4027-4032*
- Investigating Transient Characteristics of Volatile Hysteresis and Self-Heating of PrMnO<sub>3</sub>-Based RRAM. Sakhuja, J., +, *TED Dec. 2020 5520-5525*
- Investigation of Electrical Characteristic Behavior Induced by Channel-Release Process in Stacked Nanosheet Gate-All-Around MOSFETs. Kim, S., +, *TED June 2020 2648-2652*
- Investigation of Self-Heating Effects in Vacuum Gate Dielectric Gate-all-Around Vertically Stacked Silicon Nanowire Field Effect Transistors. Su, Y., +, *TED Oct. 2020 4085-4091*
- Investigation of Switching Time in GaN/AlN Resonant Tunneling Diodes by Experiments and P-SPICE Models. Zhang, W., +, *TED Jan. 2020 75-79*
- Investigation on the Effect of Gate Dielectric and Other Device Parameters on Digital Performance of Silicene Nanoribbon Tunnel FET. Singh, N.K., +, *TED July 2020 2966-2973*
- Investigations on Averaging Mechanisms of Virtual Junction Temperature Determined by  $V_{CE}(T)$  Method for IGBTs. Chen, J., +, *TED March 2020 1106-1112*
- Lateral Profiling of Defects and Charges in Oxide Semiconductor Channel Thin-Film Transistors. Nguyen, M., +, *TED Oct. 2020 4234-4237*
- Low Thermal Budget (<250 °C) Dual-Gate Amorphous Indium Tungsten Oxide (IWO) Thin-Film Transistor for Monolithic 3-D Integration. Chakraborty, W., +, *TED Dec. 2020 5336-5342*
- Low-Frequency Noise Characteristics Under the OFF-State Stress. Lee, G., +, *TED Oct. 2020 4366-4371*
- Low-Frequency Noise Parameter Extraction Method for Single-Layer Graphene FETs. Mavredakis, N., +, *TED May 2020 2093-2099*

- Modeling and Analysis of Normally-OFF p-GaN Gate AlGaN/GaN HEMT as an ON-Chip Capacitor. *Abdulsalam, A.*, +, *TED Sept. 2020 3536-3540*
- Modeling Bias Dependence of Self-Heating in GaN HEMTs Using Two Heat Sources. *Chen, X.*, +, *TED Aug. 2020 3082-3087*
- Modeling Field Effect in Black Silicon and Its Impact on Device Performance. *Heinonen, J.*, +, *TED April 2020 1645-1652*
- Modeling of Both Arrhenius and Non-Arrhenius Temperature-Dependent Drain Current for Organic Thin-Film Transistors. *He, H.*, +, *TED Nov. 2020 5091-5096*
- Modeling of Current Mismatch and  $1/f$  Noise for Halo-Implanted Drain-Extended MOSFETs. *Gupta, C.*, +, *TED Nov. 2020 4794-4801*
- Modeling of Enhancement-Mode GaN-GIT for High-Power and High-Temperature Application. *Shamsir, S.*, +, *TED Feb. 2020 588-594*
- Modeling of Short-Channel Effects in GaN HEMTs. *Allaei, M.*, +, *TED Aug. 2020 3088-3094*
- Modeling of the Vertical Leakage Current in AlN/Si Heterojunctions for GaN Power Applications. *Borga, M.*, +, *TED Feb. 2020 595-599*
- Modeling the Current-Voltage Characteristics of  $\text{Ge}_{1-x}\text{Sn}_x$  Electron-Hole Bilayer TFET With Various Compositions. *Wisniewski, P.*, +, *TED July 2020 2738-2744*
- Modeling the Influence of the Acceptor-Type Trap on the 2DEG Density for GaN MIS-HEMTs. *Shi, Y.*, +, *TED June 2020 2290-2296*
- Modeling the Key Material Properties of Germanium for Device Simulation in Cryogenic Environments. *Bradley, L.J.*, +, *TED Oct. 2020 4099-4104*
- Monolayer  $\text{MoSe}_2$ -Based Tunneling Field Effect Transistor for Ultrasensitive Strain Sensing. *Dubey, P.K.*, +, *TED May 2020 2140-2146*
- Monte Carlo Comparison of n-Type and p-Type Nanosheets With FinFETs: Effect of the Number of Sheets. *Bufler, F.M.*, +, *TED Nov. 2020 4701-4704*
- MOSFETs' Electrical Performance in the 160-nm BCD Technology Process With the Diamond Layout Shape. *Barri, D.*, +, *TED Aug. 2020 3270-3277*
- Multidomain Negative Capacitance Effect in P(VDF-TrFE) Ferroelectric Capacitor and Passive Voltage Amplification. *Singh, K.J.*, +, *TED Nov. 2020 4696-4700*
- N+ Pocket-Doped Vertical TFET for Enhanced Sensitivity in Biosensing Applications: Modeling and Simulation. *Devi, W.V.*, +, *TED May 2020 2133-2139*
- N-Buffer Design for Silicon-Based Power Diode Targeting High Dynamic Robustness and High Operating Temperature Over 448 K. *Nakamura, K.*, +, *TED June 2020 2437-2444*
- Near-Interface Trap Model for the Low Temperature Conductance Signal in SiC MOS Capacitors With Nitrided Gate Oxides. *Nicholls, J.R.*, +, *TED Sept. 2020 3722-3728*
- New  $C^\infty$  Functions for Drain-Source Voltage Clamping in Transistor Modeling. *Xia, K.*, *TED April 2020 1764-1768*
- New Strained LDMOS With Ultralow ON-Resistance by  $\text{Si}_{1-y}\text{C}_y$  Source Stressor for About 20 V Low-Voltage Applications. *Li, M.*, +, *TED Nov. 2020 4998-5004*
- Non-Quasi-Static Effects in Graphene Field-Effect Transistors Under High-Frequency Operation. *Pasadas, F.*, +, *TED May 2020 2188-2196*
- Novel Drain-Connected Field Plate GaN HEMT Designs for Improved  $V_{\text{BD}}-R_{\text{ON}}$  Tradeoff and RF PA Performance. *Soni, A.*, +, *TED April 2020 1718-1725*
- Novel Reconfigurable Field-Effect Transistor With Asymmetric Spacer Engineering at Drain Side. *Yao, Y.*, +, *TED Feb. 2020 751-757*
- Numerical Solutions for Electric Field Lines and Breakdown Voltages in Superjunction-Like Power Devices. *Huang, H.*, +, *TED Sept. 2020 3898-3902*
- On the Trap Locations in Bulk FinFETs After Hot Carrier Degradation (HCD). *Yu, Z.*, +, *TED July 2020 3005-3009*
- Opportunities in Device Scaling for 3-nm Node and Beyond: FinFET Versus GAA-FET Versus UFET. *Das, U.K.*, +, *TED June 2020 2633-2638*
- Optimal Ferroelectric Parameters for Negative Capacitance Field-Effect Transistors Based on Full-Chip Implementations—Part II: Scaling of the Supply Voltage. *Pentapati, S.*, +, *TED Jan. 2020 371-376*
- Optimization and Comparison of Drift Region Specific ON-Resistance for Vertical Power Hk MOSFETs and SJ MOSFETs With Identical Aspect Ratio. *Huang, H.*, +, *TED June 2020 2463-2470*
- Optimized Design of Carrier Injection Terminal for Reliable Low-Temperature Poly-Si TFTs Under Dynamic Hot-Carrier Stress. *Chen, L.*, +, *TED May 2020 1987-1992*
- p-Channel TFET Operation of Bilayer Structures With Type-II Heterotunneling Junction of Oxide- and Group-IV Semiconductors. *Kato, K.*, +, *TED April 2020 1880-1886*
- Parameter Extraction and Compact Modeling of OTFTs From 150 K to 350 K. *Cortes-Ordonez, H.*, +, *TED Dec. 2020 5685-5692*
- Performance and Low-Frequency Noise of 22-nm FDSOI Down to 4.2 K for Cryogenic Applications. *Cardoso Paz, B.*, +, *TED Nov. 2020 4563-4567*
- Physical Insights Into the ESD Behavior of Drain Extended FinFETs (DeFinFETs) and Unique Current Filament Dynamics. *Kumar, B.S.*, +, *TED July 2020 2717-2724*
- Physically Consistent Method for Calculating Trap-Assisted-Tunneling Current Applied to Line Tunneling Field-Effect Transistor. *Najam, F.*, +, *TED May 2020 2106-2112*
- Quantitative Characterization of Interface Traps in Ferroelectric/Dielectric Stack Using Conductance Method. *Qu, Y.*, +, *TED Dec. 2020 5315-5321*
- Quick Design of a Superjunction Considering Charge Imbalance Due to Process Variations. *Akshay, K.*, +, *TED Aug. 2020 3024-3029*
- Realistic Modeling of  $\text{MoS}_2$  Piezoelectric Transistor. *Alidoosty-Shahraki, M.*, +, *TED Aug. 2020 3459-3465*
- Reliability-Aware Statistical BSIM Compact Model Parameter Generation Methodology. *Ding, J.*, +, *TED Nov. 2020 4777-4783*
- Replacement Gate High-k/Metal Gate nMOSFETs Using a Self-Aligned Halo-Compensated Channel Implant. *Lee, Z.*, +, *TED June 2020 2232-2237*
- Resistive Analysis of Scattering-Dependent Electrical Transport in Single-Wall Carbon-Nanotube Networks. *Tripathy, S.*, +, *TED Dec. 2020 5676-5684*
- RESURF n-LDMOS Transistor for Advanced Integrated Circuits in 4H-SiC. *WeiBe, J.*, +, *TED Aug. 2020 3278-3284*
- RF Performance Projections of Negative-Capacitance FETs:  $f_t$ ,  $f_{\text{max}}$ , and  $g_m/f_t/I_D$ . *Wang, J.K.*, +, *TED Aug. 2020 3442-3450*
- Self-Heating Characterization of  $\beta\text{-Ga}_2\text{O}_3$  Thin-Channel MOSFETs by Pulsed  $I-V$  and Raman Nanothermography. *Blumenschein, N.A.*, +, *TED Jan. 2020 204-211*
- Simulation Study of a Thyristor Conduction-Insulated Gate Bipolar Transistor (TC-IGBT) With a p-n-p Base and an n-p-n Collector for Reducing Turn-Off Loss. *Jiang, M.*, +, *TED July 2020 2854-2858*
- Simulation Study on the Optimization and Scaling Behavior of LDMOS Transistors for Low-Voltage Power Applications. *Saadat, A.*, +, *TED Nov. 2020 4990-4997*
- Simulation-Based Ultralow Energy and High-Speed LIF Neuron Using Silicon Bipolar Impact Ionization MOSFET for Spiking Neural Networks. *Kumar Kamal, A.*, +, *TED June 2020 2600-2606*
- Single-Event Burnout Hardening Method and Evaluation in SiC Power MOSFET Devices. *Bi, J.*, +, *TED Oct. 2020 4340-4345*
- Speed Up Quantum Transport Device Simulation on Ferroelectric Tunnel Junction With Machine Learning Methods. *Wu, T.*, +, *TED Nov. 2020 5229-5235*
- Static and Transient Simulation of 4H-SiC VDMOS Using Full-Band Monte Carlo Simulation That Includes Real-Space Treatment of the Coulomb Interactions. *Cheng, C.*, +, *TED Sept. 2020 3705-3710*
- Study on Degradation Mechanisms of Thermal Conductivity for Confined Nanochannel in Gate-All-Around Silicon Nanowire Field-Effect Transistors. *Lai, J.*, +, *TED Oct. 2020 4060-4066*
- Super Field Plate Technique That Can Provide Charge Balance Effect for Lateral Power Devices Without Occupying Drift Region. *Zhang, C.*, +, *TED May 2020 2218-2222*
- Superjunction IGBT With Conductivity Modulation Actively Controlled by Two Separate Driving Signals. *Wei, J.*, +, *TED Oct. 2020 4335-4339*
- Suppression of Edge Effect Induced by Positive Gate Bias Stress in Low-Temperature Polycrystalline Silicon TFTs With Channel Width Extension Over Source/Drain Regions. *Wang, Y.*, +, *TED Dec. 2020 5552-5556*

- Surface Potential-Based Analytical Modeling of Electrostatic and Transport Phenomena of GaN Nanowire Junctionless MOSFET. *Khan, M.I.*, +, *TED Sept. 2020 3568-3576*
- Surface-Potential-Based Compact Model for the Gate Current of p-GaN Gate HEMTs. *Wang, J.*, +, *TED Sept. 2020 3564-3567*
- Sustained Benefits of NCFETs Under Extreme Scaling to the End of the IRDS. *Cam, T.*, +, *TED Sept. 2020 3843-3851*
- Symmetric Source and Drain Voltage Clamping Scheme for Complete Source–Drain Symmetry in Field-Effect Transistor Modeling. *Xia, K.*, *TED Aug. 2020 3042-3048*
- Systematic Modeling of Electrostatics, Transport, and Statistical Variability Effects of Interface Traps in End-of-the-Roadmap III–V MOSFETs. *Zagni, N.*, +, *TED April 2020 1560-1566*
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- 1200-V 4H-SiC Merged p-i-n Schottky Diodes With High Avalanche Capability. *Liu, L.*, +, *TED Sept. 2020 3679-3684*
- 4H-SiC CMOS Transimpedance Amplifier of Gamma-Irradiation Resistance Over 1 MGy. *Masunaga, M.*, +, *TED Jan. 2020 224-229*
- 4H-SiC UMOSFET With an Electric Field Modulation Region Below P-Body. *Cheng, Y.*, +, *TED Aug. 2020 3298-3303*
- A 4H-SiC UV Phototransistor With Excellent Optical Gain Based on Controlled Potential Barrier. *Di Benedetto, L.*, +, *TED Jan. 2020 154-159*
- A First Evaluation of Thick Oxide 3C-SiC MOS Capacitors Reliability. *Li, F.*, +, *TED Jan. 2020 237-242*
- A High-Gain CMOS Operational Amplifier Using Low-Temperature Poly-Si Oxide TFTs. *Rahaman, A.*, +, *TED Feb. 2020 524-528*
- A New Emission Mechanism for Island-Metal-Film-Based Electron Sources. *Zhan, F.*, +, *TED Nov. 2020 5119-5124*
- A Novel Confined Nitride-Trapping Layer Device for 3-D NAND Flash With Robust Retention Performances. *Fu, C.*, +, *TED March 2020 989-994*
- A Vertical Combo Spacer to Optimize Electrothermal Characteristics of 7-nm Nanosheet Gate-All-Around Transistor. *Liu, R.*, +, *TED June 2020 2249-2254*
- Advanced Low-Temperature–High-Pressure Hydrogen Treatment for Interface Defect Passivation in Si- and SiGe-Channel MOSCAPs. *Chen, K.*, +, *TED Dec. 2020 5403-5407*
- Advantage of SiO<sub>2</sub> Intermediate Layer on the Electron Injection for Ti/n-Al<sub>0.60</sub>Ga<sub>0.40</sub>N Structure. *Shao, H.*, +, *TED Sept. 2020 3548-3552*
- An Iterative Surface Potential Algorithm Including Interface Traps for Compact Modeling of SiC-MOSFETs. *Albrecht, M.*, +, *TED March 2020 855-862*
- An ON-Resistance Model for Silicon Carbide Merged p-i-n Schottky (MPS) Diodes. *Du, Q.*, +, *TED Oct. 2020 4033-4039*
- Analysis of DC, Channel Temperature, and RF Performance of *In Situ* SiN/AlGa<sub>N</sub>-Sandwich-Barrier/GaN/Al<sub>0.05</sub>GaN HEMTs. *Yang, L.*, +, *TED Oct. 2020 4147-4151*
- Analyzing the Effects of Aluminum-Doped ZnO and Ag Layers for the Transparent Electrode Vertical PCSS. *Zheng, Z.*, +, *TED June 2020 2414-2417*
- Characterization and Extraction of Power Loop Stray Inductance With SiC Half-Bridge Power Module. *Liu, Y.*, +, *TED Oct. 2020 4040-4045*
- Characterization of Schottky Barrier Diodes on Heteroepitaxial Diamond on 3C-SiC/Si Substrates. *Murooka, T.*, +, *TED Jan. 2020 212-216*
- Characterizations of Electrolyte–Insulator–Semiconductor Sensors With Array Wells and a Stack-Sensing Membrane. *Chen, H.J.H.*, +, *TED Sept. 2020 3761-3766*
- Comparative Study of SiC Planar MOSFETs With Different p-Body Designs. *Ni, W.*, +, *TED March 2020 1071-1076*
- Comparison of 2.3-kV 4H-SiC Accumulation-Channel Planar Power MOSFETs Fabricated With Linear, Square, Hexagonal, and Octagonal Cell Topologies. *Agarwal, A.*, +, *TED Sept. 2020 3673-3678*
- Design and Fabrication Approaches of 400–600 V 4H-SiC Lateral MOSFETs for Emerging Power ICs Application. *Yun, N.*, +, *TED Nov. 2020 5005-5011*
- Developing 13-kV 4H-SiC MOSFETs: Significance of Implant Straggle, Channel Design, and MOS Process on Static Performance. *Yun, N.*, +, *TED Oct. 2020 4346-4353*
- Diode-Less SiC Power Module With Countermeasures Against Bipolar Degradation to Achieve Ultrahigh Power Density. *Ishigaki, T.*, +, *TED May 2020 2035-2043*
- Direct-Bandgap Electroluminescence From Germanium With Subband Engineering Utilizing a Metal-Oxide-Semiconductor Structure. *Xie, M.*, +, *TED May 2020 2016-2021*
- Edge Termination With Enhanced Field-Limiting Rings Insensitive to Surface Charge for High-Voltage SiC Power Devices. *Hirao, T.*, +, *TED July 2020 2850-2853*
- Effect of Gate-Oxide Degradation on Electrical Parameters of Silicon Carbide MOSFETs. *Karki, U.*, +, *TED June 2020 2544-2552*
- Electro-Optical Performance Study of 4H-SiC/Pd Schottky UV Photodetector Array for Space Applications. *Karant, S.P.*, +, *TED Aug. 2020 3242-3249*
- Enhanced Ultraviolet Avalanche Photodiode With 640-nm-Thin Silicon Body Based on SOI Technology. *Alirezaei, I.S.*, +, *TED Nov. 2020 4641-4644*
- Enhancement of Hot Spot Cooling by Capped Diamond Layer Deposition for Multifinger AlGa<sub>N</sub>/Ga<sub>N</sub> HEMTs. *Zhang, H.*, +, *TED Jan. 2020 47-52*
- Estimating Junction Temperature of SiC MOSFET Using Its Drain Current During Turn-On Transient. *Du, M.*, +, *TED May 2020 1911-1918*
- Experimental Determination of Impact Ionization Coefficients Along ⟨1120⟩ in 4H-SiC. *Stefanakis, D.*, +, *TED Sept. 2020 3740-3744*
- Experimental Study on Short-Channel Effects in Double-Gate Silicon Carbide JFETs. *Kaneko, M.*, +, *TED Oct. 2020 4538-4540*
- Extraction of the 4H-SiC/SiO<sub>2</sub> Barrier Height Over Temperature. *Avino-Salvado, O.*, +, *TED Jan. 2020 63-68*
- Frequency-Improved 4H-SiC IGBT With Multizone Collector Design. *Tang, G.*, +, *TED Jan. 2020 198-203*
- GaN Vertical-Channel Junction Field-Effect Transistors With Regrown p-GaN by MOCVD. *Yang, C.*, +, *TED Oct. 2020 3972-3977*
- Gate Leakage Suppression and Breakdown Voltage Enhancement in p-GaN HEMTs Using Metal/Graphene Gates. *Zhou, G.*, +, *TED March 2020 875-880*
- Hetero-Interfacial Thermal Resistance Effects on Device Performance of Stacked Gate-All-Around Nanosheet FET. *Venkateswarlu, S.*, +, *TED Oct. 2020 4493-4499*
- High-Frequency Switching Properties and Low Oxide Electric Field and Energy Loss in a Reverse-Channel 4H-SiC UMOSFET. *Shen, Z.*, +, *TED Oct. 2020 4046-4053*
- High-Performance Ultrathin-Barrier AlGa<sub>N</sub>/Ga<sub>N</sub> Hybrid Anode Diode With Al<sub>2</sub>O<sub>3</sub> Gate Dielectric and *In Situ* Si<sub>3</sub>N<sub>4</sub>-Cap Passivation. *Zhu, L.*, +, *TED Oct. 2020 4136-4140*
- High-Quality CVD-MoS<sub>2</sub> Synthesized on Surface-Modified Al<sub>2</sub>O<sub>3</sub> for High-Performance MoS<sub>2</sub> Field-Effect Transistors. *Song, X.*, +, *TED Nov. 2020 5196-5200*
- High-Resolution Thermoreflectance Imaging Investigation of Self-Heating in AlGa<sub>N</sub>/Ga<sub>N</sub> HEMTs on Si, SiC, and Diamond Substrates. *Helou, A.E.*, +, *TED Dec. 2020 5415-5420*
- High-Voltage Drain-Extended FinFET With a High-*k* Dielectric Field Plate. *Kim, H.*, +, *TED March 2020 1077-1084*
- Hydrogen Impacts of PEALD InGaZnO TFTs Using SiO<sub>x</sub> Gate Insulators Deposited by PECVD and PEALD. *Jeong, S.*, +, *TED Oct. 2020 4250-4255*
- Impact of Electrical Stress on Defect Generation in Thin GeO<sub>2</sub>/Ge Gate Stacks Fabricated by Thermal Oxidation. *Yuan, S.*, +, *TED June 2020 2516-2521*
- Impact of Film Stress of Field-Plate Dielectric on Electric Characteristics of GaN-HEMTs. *Ando, Y.*, +, *TED Dec. 2020 5421-5426*
- Impact of Gate–Source/Drain Underlap on the Performance of Monolayer SiC Schottky-Barrier Field-Effect Transistor. *Xie, H.*, +, *TED Oct. 2020 4130-4135*
- Impact of Resistance on the Performance of Ultraviolet 4H-SiC Avalanche Photodiodes. *Zhou, X.*, +, *TED Aug. 2020 3250-3255*
- Impact of Varied Buffer Layer Designs on Single-Event Response of 1.2-kV SiC Power MOSFETs. *Lu, J.*, +, *TED Sept. 2020 3698-3704*
- Investigating the Failure Mechanism of Short-Circuit Tests in 1.2-kV SiC JBS-Integrated MOSFETs. *Zhang, Y.*, +, *TED Oct. 2020 4027-4032*
- Investigation of the Thermal Recovery From Reset Breakdown of a Si<sub>N<sub>x</sub></sub>-Based RRAM. *Hong, K.*, +, *TED April 2020 1600-1605*



- Investigations of SiC MOSFET Short-Circuit Failure Mechanisms Using Electrical, Thermal, and Mechanical Stress Analyses. Yao, K., +, *TED Oct. 2020 4328-4334*
- Low-Frequency Noise Assessment of Vertically Stacked Si n-Channel Nanosheet FETs With Different Metal Gates. Oliveira, A., +, *TED Nov. 2020 4802-4807*
- Near-Interface Trap Model for the Low Temperature Conductance Signal in SiC MOS Capacitors With Nitrided Gate Oxides. Nicholls, J.R., +, *TED Sept. 2020 3722-3728*
- New Strained LDMOS With Ultralow ON-Resistance by Si<sub>1-y</sub>C<sub>y</sub> Source Stressor for About 20 V Low-Voltage Applications. Li, M., +, *TED Nov. 2020 4998-5004*
- On Border Traps in Back-Side-Illuminated CMOS Image Sensor Oxides. Vici, A., +, *TED May 2020 2022-2027*
- On-Wafer Fast Evaluation of Failure Mechanism of 0.25- $\mu$ m AlGaIn/GaN HEMTs: Evidence of Sidewall Indiffusion. Rzin, M., +, *TED July 2020 2765-2770*
- Passivation of n- and p-Type Silicon Surfaces With Spray-Coated Sol-Gel Silicon Oxide Thin Film. Bhajipale, J., +, *TED Nov. 2020 5045-5052*
- Physical Insights Into the Mobility Enhancement in Amorphous InGaZnO Thin-Film Transistor by SiO<sub>2</sub> Passivation Layer. Zhang, P., +, *TED June 2020 2352-2358*
- Quantitative Analysis of High-Pressure Deuterium Annealing Effects on Vertically Stacked Gate-All-Around SONOS Memory. Yu, J., +, *TED Sept. 2020 3903-3907*
- Quick Design of a Superjunction Considering Charge Imbalance Due to Process Variations. Akshay, K., +, *TED Aug. 2020 3024-3029*
- RESURF n-LDMOS Transistor for Advanced Integrated Circuits in 4H-SiC. WeiBe, J., +, *TED Aug. 2020 3278-3284*
- Room Temperature Hydrogen Sensing Investigation of Zinc Oxide Schottky Thin-Film Transistors: Dependence on Film Thickness. Ghosh, S., +, *TED Dec. 2020 5701-5709*
- SiC Double-Trench MOSFETs With Embedded MOS-Channel Diode. Zhou, X., +, *TED Feb. 2020 582-587*
- SiC Trench MOSFET With Reduced Switching Loss and Increased Short-Circuit Capability. Yang, T., +, *TED Sept. 2020 3685-3690*
- Single-Event Burnout Hardening Method and Evaluation in SiC Power MOSFET Devices. Bi, J., +, *TED Oct. 2020 4340-4345*
- Size-Dependent Photoresponse of Germanium Nanocrystals-Metal Oxide Semiconductor Photodetector. Dhyani, V., +, *TED Feb. 2020 558-565*
- Spatially Resolved Diffusion of Aluminum in 4H-SiC During Postimplantation Annealing. Muting, J., +, *TED Oct. 2020 4360-4365*
- Static and Transient Simulation of 4H-SiC VDMOS Using Full-Band Monte Carlo Simulation That Includes Real-Space Treatment of the Coulomb Interactions. Cheng, C., +, *TED Sept. 2020 3705-3710*
- Suppression of the Short-Channel Effect in Dehydrogenated Elevated-Metal Metal-Oxide (EMMO) Thin-Film Transistors. Lv, N., +, *TED July 2020 3001-3004*
- Synthesis of Silica-Coated Cs<sub>4</sub>PbBr<sub>6</sub> and Cs<sub>4</sub>Pb(Br<sub>0.4</sub>I<sub>0.6</sub>)<sub>6</sub> Quantum Dots With Long Lifetime and Enhancement in Quantum Efficiency for WLEDs Applications: Lightings With High CRI and Displays With Wide Color Gamut. Lin, Y., +, *TED June 2020 2386-2392*
- TCAD Study of VLD Termination in Large-Area Power Devices Featuring a DLC Passivation. Balestra, L., +, *TED Nov. 2020 4645-4648*
- Temperature Dependence of Conductivity Modulation in SiC Bipolar Junction Transistors. Asada, S., +, *TED April 2020 1699-1704*
- The Effects of Gate-Connected Field Plates on Hotspot Temperatures of AlGaIn/GaN HEMTs. Dundar, C., +, *TED Jan. 2020 57-62*
- Theoretical Analysis of ON-State Performance Limit of 4H-SiC IGBT in Field-Stop Technology. Luo, P., +, *TED Dec. 2020 5621-5627*
- Tunneling Current in 4H-SiC p-n Junction Diodes. Kaneko, M., +, *TED Aug. 2020 3329-3334*
- Ultralow- $k$  Dielectric With Structured Pores for Interconnect Delay Reduction. Xiao, Y., +, *TED May 2020 2071-2075*
- Understanding Short-Circuit Failure Mechanism of Double-Trench SiC Power MOSFETs. Wei, J., +, *TED Dec. 2020 5593-5599*
- Silicon germanium**  
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- Silicon radiation detectors**  
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- Silicon-on-insulator**  
A Micromachined Resonant Differential Pressure Sensor. Li, Y., +, *TED Feb. 2020 640-645*  
A Novel Double-RESURF SOI-LIGBT With Improved  $V_{ON-E_{OFF}}$  Tradeoff and Low Saturation Current. Hu, H., +, *TED March 2020 1059-1065*  
A Novel No Miller Plateau SOI-LIGBT With Low Saturation Current and Improved Switching Performance. Zhang, B., +, *TED May 2020 2066-2070*  
Analysis of RF Inductive Effect in S-Parameters of Body Contact PD-SOI MOSFETs. Lee, K., +, *TED Oct. 2020 4054-4059*  
Analytical Model for Interface Traps-Dependent Back Bias Capability and Variability in Ultrathin Body and Box FDSOI MOSFETs. Chen, W., +, *TED Nov. 2020 4573-4577*  
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Characterization and Modeling of Hot Carrier Degradation in N-Channel Gate-All-Around Nanowire FETs. Gupta, C., +, *TED Jan. 2020 4-10*  
Compact Modeling of Negative-Capacitance FDSOI FETs for Circuit Simulations. Dabhi, C.K., +, *TED July 2020 2710-2716*  
Cryogenic Operation of Thin-Film FDSOI nMOS Transistors: The Effect of Back Bias on Drain Current and Transconductance. Casse, M., +, *TED Nov. 2020 4636-4640*  
Deep-Depletion Effect in SOI Substrates and its Application in Photodetectors With Tunable Responsivity and Detection Range. Arsalan, M., +, *TED Aug. 2020 3256-3262*  
Drain-Erase Scheme in Ferroelectric Field-Effect Transistor—Part I: Device Characterization. Wang, P., +, *TED March 2020 955-961*  
Effect of Charge Partitioning on IM3 Prediction in SOI-LDMOS Transistors. Gupta, S., +, *TED Feb. 2020 606-613*  
Effects of Scaling on Analog FoMs of UTBB FD-SOI MOS Transistors: A Detailed Analysis. Bhoir, M.S., +, *TED Aug. 2020 3035-3041*  
Enhanced Ultraviolet Avalanche Photodiode With 640-nm-Thin Silicon Body Based on SOI Technology. Alirezai, I.S., +, *TED Nov. 2020 4641-4644*  
Equivalent DG Dimensions Concept for Compact Modeling of Short-Channel and Thin Body GAA MOSFETs Including Quantum Confinement. Yilmaz, K., +, *TED Dec. 2020 5381-5387*  
Hall Effect Measurements in Rotating Magnetic Field on Sub-30-nm Silicon Nanowires Fabricated by a Top-Down Approach. Verma, A., +, *TED Nov. 2020 5201-5208*  
Impact of High- $k$  Gate Dielectric on Self-Heating Effects in PiFETs Structure. Belkhiria, M., +, *TED Sept. 2020 3522-3529*  
Impact of Hot-Carrier Degradation on Drain-Induced Barrier Lowering in Multifin SOI n-Channel FinFETs With Self-Heating. Gupta, C., +, *TED May 2020 2208-2212*  
Modeling of High- $Q$  Conical Inductors and MOM Capacitors for Millimeter-Wave Applications. Jeyaraman, S., +, *TED Dec. 2020 5646-5652*  
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Out-of-Equilibrium Body Potential Measurement on Silicon-on-Insulator With Deposited Metal Contacts. Alepidis, M., +, *TED Nov. 2020 4582-4586*  
Performance and Low-Frequency Noise of 22-nm FDSOI Down to 4.2 K for Cryogenic Applications. Cardoso Paz, B., +, *TED Nov. 2020 4563-4567*  
Simulation Study of a Novel Snapback Free Reverse-Conducting SOI-LIGBT With Embedded P-Type Schottky Barrier Diode. Yi, B., +, *TED May 2020 2058-2065*  
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- Study on Various Device Structures for Steep-Switching Silicon-on-Insulator Feedback Field-Effect Transistors. *Lee, C.*, +, *TED April 2020 1852-1858*
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- A CMOS-MEMS Thermal-Piezoresistive Oscillator for Mass Sensing Applications. *Zope, A.A.*, +, *TED March 2020 1183-1191*
- A Lifetime Performance Analysis of LED Luminaires Under Real-Operation Profiles. *Padmasali, A.N.*, +, *TED Jan. 2020 146-153*
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- Matrix-Addressed Flexible Capacitive Pressure Sensor With Suppressed Crosstalk for Artificial Electronic Skin. *Chen, S.*, +, *TED July 2020 2940-2944*
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- Dynamic Skymion-Mediated Switching of Perpendicular MTJs: Feasibility Analysis of Scaling to 20 nm With Thermal Noise. *Rajib, M.M.*, +, *TED Sept. 2020 3883-3888*
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- H- and E-Plane Loaded Slow Wave Structure for W-Band TWT. *Billa, L.R.*, +, *TED Jan. 2020 309-313*
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- A Novel Scheme for Gain and Power Enhancement of THz TWTs by Extended Interaction Cavities. *Shi, N.*, +, *TED Feb. 2020 667-672*
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- Numerical Computation of Dispersion Curves for Both Symmetric and Asymmetric Modes in Metal Coaxial Slow Wave Structures. *Chen, S.*, +, *TED Jan. 2020 322-327*
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- Theory, Simulation, and Analysis of the High-Frequency Characteristics for a Meander-Line Slow-Wave Structure Based on Field-Matching Methods With Dyadic Green's Function. *Wen, Z.*, +, *TED Feb. 2020 697-703*
- Wideband Rectangular TE<sub>10</sub> to TE<sub>n0</sub> Mode Converters for Terahertz-Band High-Order Overmoded Planar Slow-Wave Structures. *Shu, G.*, +, *TED March 2020 1259-1265*
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- Passivation of n- and p-Type Silicon Surfaces With Spray-Coated Sol-Gel Silicon Oxide Thin Film. *Bhajibale, J.*, +, *TED Nov. 2020 5045-5052*
- Solar cells**
- Ambient-Air-Processed Ambipolar Perovskite Phototransistor With High Photodetectivity. *Haque, F.*, +, *TED Aug. 2020 3215-3220*
- Analytical Performance Analysis of CdZnO/ZnO-Based Multiple Quantum Well Solar Cell. *Siddharth, G.*, +, *TED March 2020 1047-1051*
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- Efficiency Enhancement of Perovskite Solar Cells Using Heterojunction Bipolar Transistor Configuration. *Wahid, S.*, +, *TED Feb. 2020 552-557*
- Ga<sub>0.84</sub>In<sub>0.16</sub>As<sub>0.14</sub>Sb<sub>0.86</sub>/InAs<sub>0.91</sub>Sb<sub>0.09</sub> Dual-Junction Device for Thermophotovoltaic Energy Conversion. *Fan, T.*, +, *TED Nov. 2020 4820-4826*
- Improved Design of a Thermophotovoltaic Device. *Liao, T.*, +, *TED Nov. 2020 4709-4712*

- Investigation of DIBS-Deposited CdZnO/ZnO-Based Multiple Quantum Well for Large-Area Photovoltaic Application. *Siddharth, G.*, +, *TED Dec. 2020 5587-5592*
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Parameter Extraction and Compact Modeling of OTFTs From 150 K to 350 K. *Cortes-Ordóñez, H.*, +, *TED Dec. 2020 5685-5692*

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Accurate Temperature Estimation for Each Gate of GaN HEMT With n-Gate Fingers. *Al-Saman, A.A.*, +, *TED Sept. 2020 3577-3584*

Electro-Thermal Model for Thermal Disturbance in Cross-Point Phase-Change Memory. *Yoo, S.*, +, *TED April 2020 1454-1459*

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Gallium Nitride: A Versatile Compound Semiconductor as Novel Piezoelectric Film for Acoustic Tweezer in Manipulation of Cancer Cells. *Sun, C.*, +, *TED Aug. 2020 3355-3361*

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Interfacial Resistance Characterization for Blade-Type Phase Change Random Access Memory. *Wen, J.*, +, *TED March 2020 968-975*

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Crystalline Phase-Controlled High-Quality Hafnia Ferroelectric With RuO<sub>2</sub> Electrode. *Goh, Y.*, +, *TED Aug. 2020 3431-3434*

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Investigations of SiC MOSFET Short-Circuit Failure Mechanisms Using Electrical, Thermal, and Mechanical Stress Analyses. *Yao, K.*, +, *TED Oct. 2020 4328-4334*

#### Thermal insulation

Highly Sensitive p<sup>+</sup>Si/Al Thermopile-Based Gas Flow Sensors by Using Front-Sided Bulk Micromachining Technology. *Wang, S.*, +, *TED April 2020 1781-1786*

#### Thermal management (packaging)

A Drain-Source Connection Technique: Thermal Resistance Measurement Method for GaN HEMTs Using TSEP at High Voltage. *Li, X.*, +, *TED Dec. 2020 5454-5459*

Effect of Thermal Management on the Performance of VCSELs. *Pan, P.*, +, *TED Sept. 2020 3736-3739*

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Enhancement of Hot Spot Cooling by Capped Diamond Layer Deposition for Multifinger AlGaN/GaN HEMTs. *Zhang, H.*, +, *TED Jan. 2020 47-52*

Self-Heating Characterization of  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> Thin-Channel MOSFETs by Pulsed *I - V* and Raman Nanothermography. *Blumenschein, N.A.*, +, *TED Jan. 2020 204-211*

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#### Thermal noise

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- Interfacial Resistance Characterization for Blade-Type Phase Change Random Access Memory. *Wen, J.*, +, *TED March 2020 968-975*
- Modeling and Design of Thin-Film  $\pi$ -Type Micro Thermoelectric Generator Using Vacuum/Insulator-Hybrid Isolation for Self-Powered Wearable Devices. *Shiotsu, Y.*, +, *TED Sept. 2020 3834-3842*
- Modeling Bias Dependence of Self-Heating in GaN HEMTs Using Two Heat Sources. *Chen, X.*, +, *TED Aug. 2020 3082-3087*
- Self-Heating Characterization of  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> Thin-Channel MOSFETs by Pulsed  $I-V$  and Raman Nanothermography. *Blumenschein, N.A.*, +, *TED Jan. 2020 204-211*
- The Bidirectional Phase Control Thyristor. *Vobecky, J.*, *TED July 2020 2844-2849*
- Thermal Performance of GaN/Si HEMTs Using Near-Bandgap Thermoreflectance Imaging. *Pavlidis, G.*, +, *TED March 2020 822-827*
- Thermoelectric Property Requirements for On-Chip Cooling of Device Transients. *Nimmagadda, L.A.*, +, *TED Sept. 2020 3716-3721*
- Thermal resistance measurement**
- A Drain-Source Connection Technique: Thermal Resistance Measurement Method for GaN HEMTs Using TSEP at High Voltage. *Li, X.*, +, *TED Dec. 2020 5454-5459*
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- Correlation Between Anode Area and Sensitivity for the TiN/GaN Schottky Barrier Diode Temperature Sensor. *Li, X.*, +, *TED March 2020 1171-1175*
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- Gate Leakage Suppression and Breakdown Voltage Enhancement in p-GaN HEMTs Using Metal/Graphene Gates. *Zhou, G.*, +, *TED March 2020 875-880*
- HfO<sub>x</sub>-Based RRAM Device With Sandwich-Like Electrode for Thermal Budget Requirement. *Sun, J.*, +, *TED Oct. 2020 4193-4200*
- High-Performance Ultrathin-Barrier AlGaIn/GaN Hybrid Anode Diode With Al<sub>2</sub>O<sub>3</sub> Gate Dielectric and *In Situ* Si<sub>3</sub>N<sub>4</sub>-Cap Passivation. *Zhu, L.*, +, *TED Oct. 2020 4136-4140*
- High-Temperature Thermoelectric Energy Conversion Devices Using Si-Ge Thick Films Prepared by Laser Sintering of Nano/Micro Particles. *Xie, K.*, +, *TED May 2020 2113-2119*
- Improvement in Long-Term and High-Temperature Retention Stability of Ferroelectric Field-Effect Memory Transistors With Metal-Ferroelectric-Metal-Insulator-Semiconductor Gate-Stacks Using Al-Doped HfO<sub>2</sub> Thin Films. *Yoon, S.*, +, *TED Feb. 2020 499-504*
- Novel Quad-Interface MTJ Technology and its First Demonstration With High Thermal Stability Factor and Switching Efficiency for STT-MRAM Beyond 2X nm. *Nishioka, K.*, +, *TED March 2020 995-1000*
- Scalability of Quad Interface p-MTJ for 1X nm STT-MRAM With 10-ns Low Power Write Operation, 10 Years Retention and Endurance > 10<sup>11</sup>. *Miura, S.*, +, *TED Dec. 2020 5368-5373*
- Specific Contact Resistivity Improvement by As Preamorphization Implantation for Ti-Based Ohmic Contacts on n<sup>+</sup>-Si. *Mao, S.*, +, *TED April 2020 1726-1729*
- Surrounding Gate Vertical-Channel FET With a Gate Length of 40 nm Using BEOL-Compatible High-Thermal-Tolerance In-Al-Zn Oxide Channel. *Fujiwara, H.*, +, *TED Dec. 2020 5329-5335*
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- Integration, BEOL, and Thermal Stress Impact on CMOS-Compatible Titanium-Based Contacts for III-V Devices on a 300-mm Platform. *Boyer, F.*, +, *TED June 2020 2495-2502*
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- Thermionic cathodes**
- Electron Injector Based on Thermionic RF-Modulated Electron Gun for Particle Accelerator Applications. *Zhang, L.*, +, *TED Jan. 2020 347-353*
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- Impact of Program/Erase Cycling Interval on the Transconductance Distribution of NAND Flash Memory Devices. *Chiu, Y.*, +, *TED Nov. 2020 4897-4903*
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- Elucidation of Inhomogeneous Heterojunction Performance of Al/Cu<sub>5</sub>FeS<sub>4</sub> Schottky Diode With a Gaussian Distribution of Barrier Heights. *Sil, S.*, +, *TED May 2020 2082-2087*
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- Compact Modeling and Behavioral Simulation of an Optomechanical Sensor in Verilog A. *Dawale, H.E.*, +, *TED Nov. 2020 4677-4681*
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- New Room Temperature Ammonia Gas Sensor Synthesized by a Tantalum Pentoxide (Ta<sub>2</sub>O<sub>5</sub>) Dielectric and Catalytic Platinum (Pt) Metals. *Liu, B.*, +, *TED June 2020 2566-2572*
- Parametric Optimum Design and Performance Improvement of a Thermophotonic Cell. *Yang, Z.*, +, *TED June 2020 2376-2380*
- Study of a Palladium (Pd)/Aluminum-Doped Zinc Oxide (AZO) Hydrogen Sensor and the Kalman Algorithm for Internet-of-Things (IoT) Application. *Chen, W.*, +, *TED Oct. 2020 4405-4412*
- Thermoelectric conversion**
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Modeling and Design of Thin-Film  $\pi$ -Type Micro Thermoelectric Generator Using Vacuum/Insulator-Hybrid Isolation for Self-Powered Wearable Devices. *Shiotsu, Y.*, +, *TED Sept. 2020 3834-3842*

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Thermoelectric Property Requirements for On-Chip Cooling of Device Transients. *Nimmagadda, L.A.*, +, *TED Sept. 2020 3716-3721*

#### Thermoelectric devices

High-Temperature Thermoelectric Energy Conversion Devices Using Si-Ge Thick Films Prepared by Laser Sintering of Nano/Micro Particles. *Xie, K.*, +, *TED May 2020 2113-2119*

The Demonstration of 3-D  $\text{Bi}_{2.0}\text{Te}_{2.7}\text{Se}_{0.3}/\text{Bi}_{0.4}\text{Te}_{3.0}\text{Sb}_{1.6}$  Thermoelectric Devices by Ionized Sputter System. *Liao, M.*, +, *TED Jan. 2020 406-408*

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$\text{Ga}_{0.84}\text{In}_{0.16}\text{As}_{0.14}\text{Sb}_{0.86}/\text{InAs}_{0.91}\text{Sb}_{0.09}$  Dual-Junction Device for Thermophotovoltaic Energy Conversion. *Fan, T.*, +, *TED Nov. 2020 4820-4826*

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#### Thermopiles

Highly Sensitive p<sup>+</sup>/Si/Al Thermopile-Based Gas Flow Sensors by Using Front-Sided Bulk Micromachining Technology. *Wang, S.*, +, *TED April 2020 1781-1786*

Modeling and Design of Thin-Film  $\pi$ -Type Micro Thermoelectric Generator Using Vacuum/Insulator-Hybrid Isolation for Self-Powered Wearable Devices. *Shiotsu, Y.*, +, *TED Sept. 2020 3834-3842*

#### Thermoreflectance

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#### Thick film resistors

Statistical Description of High-Voltage Pulse Trimming of RuO<sub>2</sub> and Bi<sub>2</sub>Ru<sub>2</sub>O<sub>7</sub>-Based Thick Resistive Films. *Stanimirovic, Z.*, +, *TED Feb. 2020 600-605*

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High-Temperature Thermoelectric Energy Conversion Devices Using Si-Ge Thick Films Prepared by Laser Sintering of Nano/Micro Particles. *Xie, K.*, +, *TED May 2020 2113-2119*

#### Thickness measurement

Technological Sensor on Coupled Radial Spirals. *Pchel'nikov, Y.N.*, +, *TED March 2020 1165-1170*

#### Thin film capacitors

Electrical Properties of Al<sub>2</sub>O<sub>3</sub>/ZnO Metal-Insulator-Semiconductor Capacitors. *Zhang, Q.*, +, *TED Nov. 2020 5033-5038*

Experimental Study of  $1/f^{1+\alpha}$  Noise in Transient Leakage Current of Metal-Insulator-Metal With Stacked High-k Polycrystalline Films. *Lin, H.*, +, *TED June 2020 2503-2509*

Insertion of HfO<sub>2</sub> Seed/Dielectric Layer to the Ferroelectric HZO Films for Heightened Remanent Polarization in MFM Capacitors. *Gaddam, V.*, +, *TED Feb. 2020 745-750*

The Investigation for Thickness-Dependent Electrical Performance on BaTiO<sub>3</sub>/BiFeO<sub>3</sub> Bilayer Ferromagnetic Capacitors. *Lien, C.*, +, *TED Aug. 2020 3417-3423*

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A Study on the Temperature-Dependent Operation of Fluorite-Structure-Based Ferroelectric HfO<sub>2</sub> Memory FeFET: Pyroelectricity and Reliability. *Ali, T.*, +, *TED July 2020 2981-2987*

Audio System Fabricated With Flexible Hybrid Electronics. *Street, R.A.*, +, *TED March 2020 1270-1276*

Dilute Oxygen Alloys of ZnS as a Promising Toxic-Free Buffer Layer for Cu(In, Ga)Se<sub>2</sub> Thin-Film Solar Cells. *Alqahtani, S.M.*, +, *TED April 2020 1666-1673*

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Modeling Field Effect in Black Silicon and Its Impact on Device Performance. *Heinonen, J.*, +, *TED April 2020 1645-1652*

Retinal Prosthesis Using Thin-Film Devices on a Transparent Substrate and Wireless Power Transfer. *Tomioka, K.*, +, *TED Feb. 2020 529-534*

V-Pits-Induced Photoresponse Enhancement in AlGaIn UV-B Photodetectors on Si (111). *Rathkanthiwar, S.*, +, *TED Oct. 2020 4281-4287*

#### Thin film sensors

A Force and Temperature Sensor Array Based on 3-D Field-Coupled Thin-Film Transistors for Tactile Intelligence. *Li, W.*, +, *TED July 2020 2890-2895*

A Highly Sensitive Ammonia (NH<sub>3</sub>) Sensor Based on a Tungsten Trioxide (WO<sub>3</sub>) Thin Film Decorated With Evaporated Platinum (Pt) Nanoparticles. *Chang, C.*, +, *TED March 2020 1176-1182*

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Amplified Methanol Sensitivity in Reduced Graphene Oxide FET Using Appropriate Gate Electrostatic. *Hazra, A.*, *TED Nov. 2020 5111-5118*

Encapsulated X-Ray Detector Enabled by All-Inorganic Lead-Free Perovskite Film With High Sensitivity and Low Detection Limit. *Zhang, H.*, +, *TED Aug. 2020 3191-3198*

Fabrication of Microsensor for Detection of Low-Concentration Formaldehyde Gas in Formalin-Treated Fish. *Das, S.*, +, *TED Dec. 2020 5710-5716*

New Room Temperature Ammonia Gas Sensor Synthesized by a Tantalum Pentoxide (Ta<sub>2</sub>O<sub>5</sub>) Dielectric and Catalytic Platinum (Pt) Metals. *Liu, B.*, +, *TED June 2020 2566-2572*

Polycrystalline In-Ga-O Thin-Film Transistors Coupled With a Nitrogen Doping Technique for High-Performance UV Detectors. *Cheng, Y.*, +, *TED Jan. 2020 140-145*

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Temperature Dependence of Sensing Characteristics for OTFT-Based Hydrogen Sensor. *Li, B.*, +, *TED April 2020 1776-1780*

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A High Gain Low-Noise Amplifier Based on ITO-Stabilized ZnO Thin-Film Transistors. *Fan, H.*, +, *TED Dec. 2020 5537-5543*

A High-Gain CMOS Operational Amplifier Using Low-Temperature Poly-Si Oxide TFTs. *Rahaman, A.*, +, *TED Feb. 2020 524-528*

A Monolithic 3-D Integration of RRAM Array and Oxide Semiconductor FET for In-Memory Computing in 3-D Neural Network. *Wu, J.*, +, *TED Dec. 2020 5322-5328*

A Physical-Based Analytical Model for the Kink Current of Polycrystalline Silicon TFTs. *Chen, Y.*, +, *TED June 2020 2359-2364*

A Physics-Based Compact Model for Ultrathin Black Phosphorus FETs—Part II: Model Validation Against Numerical and Experimental Data. *Yar-moghaddam, E.*, +, *TED Jan. 2020 397-405*

Abnormal Hump Effect Induced by Hydrogen Diffusion During Self-Heating Stress in Top-Gate Amorphous InGaZnO TFTs. *Chen, H.*, +, *TED July 2020 2807-2811*

Achieving High Mobility and Excellent Stability in Amorphous In-Ga-Zn-Sn-O Thin-Film Transistors. *Choi, I.M.*, +, *TED March 2020 1014-1020*

Amorphous ITZO Thin-Film Transistors by Using Ultrasonic Spray Pyrolysis Deposition. *Liu, H.*, +, *TED March 2020 1009-1013*

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An 18.6- $\mu\text{m}$ -Pitch Gate Driver Using a-IGZO TFTs for Ultrahigh-Definition AR/VR Displays. *Chen, Y.*, +, *TED Nov. 2020 4929-4933*

- An Active Multielectrode Array for Collecting Surface Electromyogram Signals Using a-IGZO TFT Technology on Polyimide Substrate. *Mao, S.*, +, *TED April 2020 1613-1618*
- An Inkjet-Printed Full-Wave Rectifier for Low-Voltage Operation Using Electrolyte-Gated Indium-Oxide Thin-Film Transistors. *Feng, X.*, +, *TED Nov. 2020 4918-4923*
- Analytical Current–Voltage Model for Double-Gate a-IGZO TFTs With Symmetric Structure for Above Threshold. *Hernandez-Barrios, Y.*, +, *TED May 2020 1980-1986*
- Analytical Drain Current and Capacitance Model for Amorphous InGaZnO TFTs Considering Temperature Characteristics. *He, H.*, +, *TED Sept. 2020 3637-3644*
- Causes of the Difference Between Hall Mobility and Field-Effect Mobility for p-Type RF Sputtered Cu<sub>2</sub>O Thin-Film Transistors. *Jo, J.*, +, *TED Dec. 2020 5557-5563*
- Charge-Based Model for the Drain-Current Variability in Organic Thin-Film Transistors Due to Carrier-Number and Correlated- Mobility Fluctuation. *Nikolaou, A.*, +, *TED Nov. 2020 4667-4671*
- CMOS-Like Logic Circuits With Unipolar Thin-Film Transistors on Flexible Substrate. *Li, Q.*, +, *TED Feb. 2020 512-517*
- Compact Modeling of Short-Channel Effects in Staggered Organic Thin-Film Transistors. *Pruefer, J.*, +, *TED Nov. 2020 5082-5090*
- Corrections to “Low-Voltage IGZO TFTs Using Solution-Deposited OTS-Modified Ta<sub>2</sub>O<sub>5</sub> Dielectric”. *Mohammadian, N.*, +, *TED Oct. 2020 4545*
- Density-of-States-Based Physical Model for Ink-Jet Printed Thiophene Polymeric TFTs. *Lee, J.*, +, *TED Jan. 2020 283-288*
- Deposition of c-Axis Aligned Crystalline InGaZnO by Mist Atmospheric Pressure Chemical Vapor Deposition for Thin-Film Transistor Applications. *Liu, H.*, +, *TED Oct. 2020 4245-4249*
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- Effect of ELA Energy Density on Self-Heating Stress in Low-Temperature Polycrystalline Silicon Thin-Film Transistors. *Huang, S.*, +, *TED Aug. 2020 3163-3166*
- Effect of Self-Assembled Monolayers (SAMs) as Surface Passivation on the Flexible a-InSnZnO Thin-Film Transistors. *Zhong, W.*, +, *TED Aug. 2020 3157-3162*
- Effect of Two-Step Annealing on High Stability of a-IGZO Thin-Film Transistor. *Peng, C.*, +, *TED Oct. 2020 4262-4268*
- Effects of Redundant Electrode Width on Stability of a-InGaZnO Thin-Film Transistors Under Hot-Carrier Stress. *Lin, D.*, +, *TED June 2020 2372-2375*
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- Room Temperature Hydrogen Sensing Investigation of Zinc Oxide Schottky Thin-Film Transistors: Dependence on Film Thickness. *Ghosh, S.*, +, *TED Dec. 2020 5701-5709*
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- Ultrasensitive Detection of Mercury Ions Under UV Illumination of MoS<sub>2</sub> Functionalized AlGaIn/GaN Transistor. *Nigam, A.*, +, *TED Dec. 2020 5693-5700*
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- Influence of the Surface Tungsten Distribution on the Emission Properties of Barium Tungsten Cathode. *Shang, J.*, +, *TED June 2020 2580-2584*
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