Ruizhe Zhang

List of Publications by Year
in descending order

97 papers	5,082 citations	94433 37 h-index	102487 66 g-index
97 all docs	97 docs citations	97 times ranked	4145 citing authors

#	Article	IF	Citations
1	Robustness of Cascode GaN HEMTs in Unclamped Inductive Switching. IEEE Transactions on Power Electronics, 2022, 37, 4148-4160.	7.9	38
2	Tuning Avalanche Path in Vertical GaN JFETs By Gate Driver Design. IEEE Transactions on Power Electronics, 2022, 37, 5433-5443.	7.9	15
3	Breakthrough Short Circuit Robustness Demonstrated in Vertical GaN Fin JFET. IEEE Transactions on Power Electronics, 2022, 37, 6253-6258.	7.9	23
4	Robust Through-Fin Avalanche in Vertical GaN Fin-JFET With Soft Failure Mode. IEEE Electron Device Letters, 2022, 43, 366-369.	3.9	15
5	A review of band structure and material properties of transparent conducting and semiconducting oxides: Ga2O3, Al2O3, In2O3, ZnO, SnO2, CdO, NiO, CuO, and Sc2O3. Applied Physics Reviews, 2022, 9, .	11.3	124
6	GaN MIS-HEMTs in Repetitive Overvoltage Switching: Parametric Shift and Recovery. , 2022, , .		3
7	Accelerating the Recovery of p-Gate GaN HEMTs after Overvoltage Stresses. , 2022, , .		3
8	A perspective on multi-channel technology for the next-generation of GaN power devices. Applied Physics Letters, 2022, 120, .	3.3	16
9	Overvoltage Ruggedness and Dynamic Breakdown Voltage of P-Gate GaN HEMTs in High-Frequency Switching up to Megahertz. , 2022, , .		6
10	Circuitâ€Level Memory Technologies and Applications based on 2D Materials. Advanced Materials, 2022, 34, .	21.0	17
11	(Invited) Breakthrough Avalanche and Short Circuit Robustness in Vertical GaN Power Devices. ECS Transactions, 2022, 108, 11-20.	0.5	0
12	10 kV GaN Power Diodes and Transistors with Performance beyond SiC Limit. , 2022, , .		1
13	Heating issues in wide-bandgap semiconductor devices. , 2022, , 1-19.		0
14	Packaging of a 10-kV Double-Side Cooled Silicon Carbide Diode Module With Thin Substrates Coated by a Nonlinear Resistive Polymer-Nanoparticle Composite. IEEE Transactions on Power Electronics, 2022, 37, 14462-14470.	7.9	9
15	Activating Thick Buried p-GaN for Device Applications. IEEE Transactions on Electron Devices, 2022, 69, 4224-4230.	3.0	4
16	(Invited) Considerations and Strategies for High-Temperature Ultra-Wide Bandgap Gallium Oxide Power Modules. ECS Meeting Abstracts, 2022, MA2022-01, 1320-1320.	0.0	1
17	(Invited) Breakthrough Avalanche and Short Circuit Robustness in Vertical GaN Power Devices. ECS Meeting Abstracts, 2022, MA2022-01, 1307-1307.	0.0	0
18	Switching Performance Analysis of Vertical GaN FinFETs: Impact of Interfin Designs. IEEE Journal of Emerging and Selected Topics in Power Electronics, 2021, 9, 2235-2246.	5.4	23

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19	Third Quadrant Conduction Loss of 1.2â€“10 kV SiC MOSFETs: Impact of Gate Bias Control. IEEE Transactions on Power Electronics, 2021, 36, 2033-2043.	7.9	25
20	Overcoming the limitations of gallium oxide through heterogeneous integration. Science China: Physics, Mechanics and Astronomy, 2021, 64, 1.	5.1	1
21	TCAD-Augmented Machine Learning With and Without Domain Expertise. IEEE Transactions on Electron Devices, 2021, 68, 5498-5503.	3.0	30
22	GaN FinFETs and trigate devices for power and RF applications: review and perspective. Semiconductor Science and Technology, 2021, 36, 054001.	2.0	59
23	Failure Mechanisms of Cascode GaN HEMTs Under Overvoltage and Surge Energy Events. , 2021, , .		11
24	Robustness of GaN Gate Injection Transistors under Repetitive Surge Energy and Overvoltage. , 2021, , .		8
25	True Breakdown Voltage and Overvoltage Margin of GaN Power HEMTs in Hard Switching. IEEE Electron Device Letters, 2021, 42, 505-508.	3.9	49
26	1.2-kV Vertical GaN Fin-JFETs: High-Temperature Characteristics and Avalanche Capability. IEEE Transactions on Electron Devices, 2021, 68, 2025-2032.	3.0	66
27	Kilovolt Tri-Gate GaN Junction HEMTs with High Thermal Stability. , 2021, , .		6
28	Robustness of Cascode GaN HEMTs under Repetitive Overvoltage and Surge Energy Stresses. , 2021, , .		12
29	10 kV, 39 mÎ©Â·cm² Multi-Channel AlGaN/GaN Schottky Barrier Diodes. IEEE Electron Device Letters, 2021, 42, 808-811.	3.9	60
30	Analysis of Voltage Sharing of Series-Connected SiC MOSFETs and Body-Diodes. IEEE Transactions on Power Electronics, 2021, 36, 7612-7624.	7.9	35
31	Low Thermal Resistance (0.5 K/W) Gaâ‚‚Oâ‚ƒ Schottky Rectifiers With Double-Side Packaging. IEEE Electron Device Letters, 2021, 42, 1132-1135.	3.9	24
32	Packaged Ga₂O₃ Schottky Rectifiers With Over 60-A Surge Current Capability. IEEE Transactions on Power Electronics, 2021, 36, 8565-8569.	7.9	67
33	Surge Current and Avalanche Ruggedness of 1.2-kV Vertical GaN p-n Diodes. IEEE Transactions on Power Electronics, 2021, 36, 10959-10964.	7.9	42
34	(Invited) Multi-Channel AlGaN/GaN Power Rectifiers: Breakthrough Performance up to 10 kV. ECS Transactions, 2021, 104, 51-59.	0.5	1
35	(Invited) How to Achieve Low Thermal Resistance and High Electrothermal Ruggedness in Ga₂O₃ Devices?. ECS Transactions, 2021, 104, 21-32.	0.5	2
36	Tri-Gate GaN Junction HEMTs: Physics and Performance Space. IEEE Transactions on Electron Devices, 2021, 68, 4854-4861.	3.0	14

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37	Emerging GaN technologies for power, RF, digital, and quantum computing applications: Recent advances and prospects. Journal of Applied Physics, 2021, 130, .	2.5	89
38	(Invited) How to Achieve Low Thermal Resistance and High Electrothermal Ruggedness in Ga2O3 Devices?. ECS Meeting Abstracts, 2021, MA2021-02, 965-965.	0.0	0
39	Evaluation of 650V, 100A Direct-Drive GaN Power Switch for Electric Vehicle Powertrain Applications. , 2021, , .		7
40	Tri-gate GaN junction HEMT. Applied Physics Letters, 2020, 117, .	3.3	29
41	Analysis of Parasitic Capacitorsâ€™ Impact on Voltage Sharing of Series-Connected SiC MOSFETs and Body-Diodes. , 2020, , .		8
42	Trap-Mediated Avalanche in Large-Area 1.2 kV Vertical GaN p-n Diodes. IEEE Electron Device Letters, 2020, 41, 1328-1331.	3.9	40
43	Improvement of TCAD Augmented Machine Learning Using Autoencoder for Semiconductor Variation Identification and Inverse Design. IEEE Access, 2020, 8, 143519-143529.	4.2	31
44	TCAD-Machine Learning Framework for Device Variation and Operating Temperature Analysis With Experimental Demonstration. IEEE Journal of the Electron Devices Society, 2020, 8, 992-1000.	2.1	31
45	Origin of leakage current in vertical GaN devices with nonplanar regrown p-GaN. Applied Physics Letters, 2020, 117, .	3.3	21
46	Recent Development in 2D and 3D GaN devices for RF and Power Electronics Applications. , 2020, , .		0
47	Surge current capability of ultra-wide-bandgap Ga2O3 Schottky diodes. Microelectronics Reliability, 2020, 114, 113743.	1.7	22
48	Surge-Energy and Overvoltage Ruggedness of P-Gate GaN HEMTs. IEEE Transactions on Power Electronics, 2020, 35, 13409-13419.	7.9	79
49	3.3 kV Multi-Channel AlGaN/GaN Schottky Barrier Diodes With P-GaN Termination. IEEE Electron Device Letters, 2020, 41, 1177-1180.	3.9	67
50	(Ultra)Wide-Bandgap Vertical Power FinFETs. IEEE Transactions on Electron Devices, 2020, 67, 3960-3971.	3.0	76
51	Surge Energy Robustness of GaN Gate Injection Transistors. , 2020, , .		13
52	Lateral p-GaN/2DEG junction diodes by selective-area p-GaN trench-filling-regrowth in AlGaN/GaN. Applied Physics Letters, 2020, 116, .	3.3	41
53	Hard-Switched Overvoltage Robustness of p-Gate GaN HEMTs at Increasing Temperatures. , 2020, , .		10
54	Application of Noise to Avoid Overfitting in TCAD Augmented Machine Learning. , 2020, , .		17

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55	(Invited) Ruggedness of SiC and GaN Power Transistors in Switching Based Tests. ECS Transactions, 2020, 98, 37-48.	0.5	0
56	(Invited) Ruggedness of SiC and GaN Power Transistors in Switching Based Tests. ECS Meeting Abstracts, 2020, MA2020-02, 1813-1813.	0.0	0
57	Vertical Ga₂O₃Schottky Barrier Diodes With Small-Angle Beveled Field Plates: A Baligaâ€™s Figure-of-Merit of 0.6 GW/cm². IEEE Electron Device Letters, 2019, 40, 1399-1402.	3.9	139
58	ON-Resistance in Vertical Power FinFETs. IEEE Transactions on Electron Devices, 2019, 66, 3903-3909.	3.0	26
59	Two-dimensional MoS2-enabled flexible rectenna for Wi-Fi-band wireless energy harvesting. Nature, 2019, 566, 368-372.	27.8	266
60	Asymmetric hot-carrier thermalization and broadband photoresponse in graphene-2D semiconductor lateral heterojunctions. Science Advances, 2019, 5, eaav1493.	10.3	43
61	p-Channel GaN Transistor Based on p-GaN/AlGaN/GaN on Si. IEEE Electron Device Letters, 2019, 40, 1036-1039.	3.9	88
62	Leakage and breakdown mechanisms of GaN vertical power FinFETs. Applied Physics Letters, 2019, 114, .	3.3	43
63	Design and Simulation of GaN Superjunction Transistors With 2-DEG Channels and Fin Channels. IEEE Journal of Emerging and Selected Topics in Power Electronics, 2019, 7, 1475-1484.	5.4	40
64	First Demonstration of Waferscale Heterogeneous Integration of Ga₂O₃ MOSFETs on SiC and Si Substrates by Ion-Cutting Process. , 2019, , .		42
65	Switching Performance Evaluation of 1200 V Vertical GaN Power FinFETs. , 2019, , .		5
66	Superjunction Power Transistors with Interface Charges: A Case Study for GaN. IEEE Journal of the Electron Devices Society, 2019, , 1-1.	2.1	9
67	High-voltage vertical Ga2O3 power rectifiers operational at high temperatures up to 600â€‰K. Applied Physics Letters, 2019, 115, .	3.3	58
68	720-V/0.35-m<inline-formula> <tex-math notation="LaTeX">$Omega cdot$ </tex-math> </inline-formula>cm²Fully Vertical GaN-on-Si Power Diodes by Selective Removal of Si Substrates and Buffer Layers. IEEE Electron Device Letters, 2018, 39, 715-718.	3.9	69
69	The 2018 GaN power electronics roadmap. Journal Physics D: Applied Physics, 2018, 51, 163001.	2.8	843
70	AlN metalâ€"semiconductor field-effect transistors using Si-ion implantation. Japanese Journal of Applied Physics, 2018, 57, 04FR11.	1.5	42
71	Materials and processing issues in vertical GaN power electronics. Materials Science in Semiconductor Processing, 2018, 78, 75-84.	4.0	112
72	Large Area 1.2 kV GaN Vertical Power FinFETs with a Record Switching Figure-of-Merit. IEEE Electron Device Letters, 2018, , 1-1.	3.9	69

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73	MoS₂ Phase-junction-based Schottky Diodes for RF Electronics. , 2018, , .		8
74	Gallium nitride vertical power devices on foreign substrates: a review and outlook. Journal Physics D: Applied Physics, 2018, 51, 273001.	2.8	173
75	High-Performance GaN Vertical Fin Power Transistors on Bulk GaN Substrates. IEEE Electron Device Letters, 2017, 38, 509-512.	3.9	210
76	Trench formation and corner rounding in vertical GaN power devices. Applied Physics Letters, 2017, 110, .	3.3	77
77	High-Performance 500 V Quasi- and Fully-Vertical GaN-on-Si pn Diodes. IEEE Electron Device Letters, 2017, 38, 248-251.	3.9	70
78	Reduction of on-resistance and current crowding in quasi-vertical GaN power diodes. Applied Physics Letters, 2017, 111, .	3.3	39
79	Vertical GaN Junction Barrier Schottky Rectifiers by Selective Ion Implantation. IEEE Electron Device Letters, 2017, 38, 1097-1100.	3.9	136
80	Beyond Thermal Management: Incorporating p-Diamond Back-Barriers and Cap Layers Into AlGaN/GaN HEMTs. IEEE Transactions on Electron Devices, 2016, 63, 2340-2345.	3.0	36
81	GaN HEMTs with multi-functional p-diamond back-barriers. , 2016, , .		1
82	Design, Modeling, and Fabrication of Chemical Vapor Deposition Grown MoS₂ Circuits with E-Mode FETs for Large-Area Electronics. Nano Letters, 2016, 16, 6349-6356.	9.1	142
83	The Impact of Defects on GaN Device Behavior: Modeling Dislocations, Traps, and Pits. ECS Journal of Solid State Science and Technology, 2016, 5, P3142-P3148.	1.8	29
84	Advanced power electronic devices based on Gallium Nitride (GaN). , 2015, , .		6
85	High-Performance WSe₂ Complementary Metal Oxide Semiconductor Technology and Integrated Circuits. Nano Letters, 2015, 15, 4928-4934.	9.1	204
86	Origin and Control of OFF-State Leakage Current in GaN-on-Si Vertical Diodes. IEEE Transactions on Electron Devices, 2015, 62, 2155-2161.	3.0	185
87	Native and process induced defects in GaN films grown on Si substrates probed using a monoenergetic positron beam. , 2014, , .		0
88	Vacancy clusters introduced by CF₄-based plasma treatment in GaN probed with a monoenergetic positron beam. Applied Physics Express, 2014, 7, 121001.	2.4	5
89	GaN-on-Si Vertical Schottky and p-n Diodes. IEEE Electron Device Letters, 2014, 35, 618-620.	3.9	154
90	Electrothermal Simulation and Thermal Performance Study of GaN Vertical and Lateral Power Transistors. IEEE Transactions on Electron Devices, 2013, 60, 2224-2230.	3.0	142

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91	Formation of low resistance ohmic contacts in GaN-based high electron mobility transistors with BCl3 surface plasma treatment. Applied Physics Letters, 2013, 103, .	3.3	33
92	High voltage GaN HEMT compact model: Experimental verification, field plate optimization and charge trapping. , 2013, , .		27
93	High threshold voltage in GaN MOS-HEMTs modulated by fluorine plasma and gate oxide. , 2013, , .		8
94	Threshold voltage control by gate oxide thickness in fluorinated GaN metal-oxide-semiconductor high-electron-mobility transistors. Applied Physics Letters, 2013, 103, .	3.3	88
95	Accurate characterization of room-temperature long range magnetic order in GaN: Mn by magnetic force microscope. Science China Technological Sciences, 2011, 54, 15-18.	4.0	0
96	Influence of Si co-doping on magnetic, electrical and optical properties of Ga1â€“x Mn x N film grown by MOCVD. Science China Technological Sciences, 2011, 54, 1703-1707.	4.0	1
97	Ultrathin MgB₂films fabricated on Al₂O₃substrate by hybrid physicalâ€“chemical vapor deposition with high<i>T</i>_cand<i>J</i>_c. Superconductor Science and Technology, 2011, 24, 015013.	3.5	23