Tetsu Kachi

List of Publications by Citations

114 papers	1,945 citations	22 h-index	38 g-index
124 ext. papers	2,318 ext. citations	2.3 avg, IF	5.38 L-index

#	Paper	IF	Citations
114	Recent progress of GaN power devices for automotive applications. *Japanese Journal of Applied Physics*, **2014**, 53, 100210	1.4	220
113	GaN-Based Trench Gate Metal Oxide Semiconductor Field-Effect Transistor Fabricated with Novel Wet Etching. *Applied Physics Express*, **2008**, 1, 021104	2.4	184
112	A Vertical Insulated Gate AlGaN/GaN Heterojunction Field-Effect Transistor. *Japanese Journal of Applied Physics*, **2007**, 46, L503-L505	1.4	139
111	P-type doping of GaN$(000bar{1})$ by magnesium ion implantation. *Applied Physics Express*, **2017**, 10, 016501	2.4	65
110	Highly effective activation of Mg-implanted p-type GaN by ultra-high-pressure annealing. *Applied Physics Letters*, **2019**, 115, 142104	3.4	58
109	A new buffer layer for high quality GaN growth by metalorganic vapor phase epitaxy. *Applied Physics Letters*, **1998**, 72, 704-706	3.4	49
108	The origin of carbon-related carrier compensation in p-type GaN layers grown by MOVPE. *Journal of Applied Physics*, **2018**, 124, 215701	2.5	46
107	Design and Fabrication of GaN p-n Junction Diodes With Negative Beveled-Mesa Termination. *IEEE Electron Device Letters*, **2019**, 40, 941-944	4.4	45
106	Sources of carrier compensation in metalorganic vapor phase epitaxy-grown homoepitaxial n-type GaN layers with various doping concentrations. *Applied Physics Express*, **2018**, 11, 041001	2.4	41
105	Characteristics of SiO2/n-GaN interfaces with □Ga2O3 interlayers. *Applied Physics Letters*, **2003**, 83, 4336-4338	3.4	35
104	As-grown deep-level defects in n-GaN grown by metal□rganic chemical vapor deposition on freestanding GaN. *Journal of Applied Physics*, **2012**, 112, 053513	2.5	31
103	Study of etching-induced damage in GaN by hard X-ray photoelectron spectroscopy. *Physica Status Solidi (A) Applications and Materials Science*, **2011**, 208, 1541-1544	1.6	30
102	Excitation Spectra of the Visible Photoluminescence of Anodized Porous Silicon. *Japanese Journal of Applied Physics*, **1992**, 31, L207-L209	1.4	30
101	Progress on and challenges of p-type formation for GaN power devices. *Journal of Applied Physics*, **2020**, 128, 090901	2.5	30
100	The trap states in lightly Mg-doped GaN grown by MOVPE on a freestanding GaN substrate. *Journal of Applied Physics*, **2018**, 123, 161405	2.5	28
99	Electrical properties of thermally oxidized p-GaN metal□xide□emiconductor diodes. *Applied Physics Letters*, **2003**, 82, 2443-2445	3.4	28
98	Experimental Validation of Normally-On GaN HEMT and Its Gate Drive Circuit. *IEEE Transactions on Industry Applications*, **2015**, 51, 2415-2422	4.3	27

97	Current status of GaN power devices. *IEICE Electronics Express*, **2013**, 10, 20132005-20132005	0.5	25
96	Impact ionization coefficients and critical electric field in GaN. *Journal of Applied Physics*, **2021**, 129, 185702	2.5	23
95	Reliability Evaluation of Al2O3Deposited by Ozone-Based Atomic Layer Deposition on Dry-Etched n-Type GaN. *Japanese Journal of Applied Physics*, **2013**, 52, 08JN19	1.4	22
94	Advanced SiC and GaN power electronics for automotive systems **2010**,		22
93	Formation of helical dislocations in ammonothermal GaN substrate by heat treatment. *Semiconductor Science and Technology*, **2016**, 31, 034002	1.8	22
92	Defect evolution in Mg ions implanted GaN upon high temperature and ultrahigh N2 partial pressure annealing: Transmission electron microscopy analysis. *Journal of Applied Physics*, **2020**, 127, 105106	2.5	20
91	GaN power device and reliability for automotive applications **2012**,		20
90	Reduction of Mg segregation in a metalorganic vapor phase epitaxial grown GaN layer by a low-temperature AlN interlayer. *Journal of Applied Physics*, **2008**, 104, 014906	2.5	20
89	Electric-field-induced simultaneous diffusion of Mg and H in Mg-doped GaN prepared using ultra-high-pressure annealing. *Applied Physics Express*, **2019**, 12, 111005	2.4	19
88	Evaluation of dislocation-related defects in GaN using deep-level transient spectroscopy. *Physica Status Solidi C: Current Topics in Solid State Physics*, **2007**, 4, 2568-2571		19
87	Effect of N/Ge co-implantation on the Ge activation in GaN. *Applied Physics Letters*, **2001**, 79, 1468-1470	3.4	19
86	Overview of carrier compensation in GaN layers grown by MOVPE: toward the application of vertical power devices. *Japanese Journal of Applied Physics*, **2020**, 59, SA0804	1.4	19
85	Redistribution of Mg and H atoms in Mg-implanted GaN through ultra-high-pressure annealing. *Applied Physics Express*, **2020**, 13, 086501	2.4	18
84	Current deep-level transient spectroscopy investigation of acceptor levels in Mg-doped GaN. *Applied Physics Letters*, **2001**, 79, 1631-1633	3.4	17
83	Fully Ion Implanted Normally-Off GaN DMOSFETs with ALD-Al□□ Gate Dielectrics. *Materials*, **2019**, 12,	3.5	16
82	Effects of a photo-assisted electrochemical etching process removing dry-etching damage in GaN. *Japanese Journal of Applied Physics*, **2018**, 57, 121001	1.4	16
81	Reduction of plasma-induced damage in n-type GaN by multistep-bias etching in inductively coupled plasma reactive ion etching. *Applied Physics Express*, **2020**, 13, 016505	2.4	15
80	High Pressure Processing of Ion Implanted GaN. *Electronics (Switzerland)*, **2020**, 9, 1380	2.6	15

79	Impact Ionization Coefficients in GaN Measured by Above- and Sub-Eg Illuminations for p⁺/n+ Junction **2019**,		15
78	Measurement of avalanche multiplication utilizing Franz-Keldysh effect in GaN p-n junction diodes with double-side-depleted shallow bevel termination. *Applied Physics Letters*, **2019**, 115, 142101	3.4	14
77	Identification of origin of E C □0.6 eV electron trap level by correlation with iron concentration in n-type GaN grown on GaN freestanding substrate by metalorganic vapor phase epitaxy. *Applied Physics Express*, **2020**, 13, 071007	2.4	14
76	Cathodoluminescence Study on Thermal Recovery Process of Mg-Ion Implanted N-Polar GaN. *Physica Status Solidi (B): Basic Research*, **2018**, 255, 1700379	1.3	14
75	Improvement of Current Collapse by Surface Treatment and Passivation Layer in p-GaN Gate GaN High-Electron-Mobility Transistors. *Japanese Journal of Applied Physics*, **2013**, 52, 04CF08	1.4	14
74	Study on leakage current of pn diode on GaN substrate at reverse bias. *Physica Status Solidi C: Current Topics in Solid State Physics*, **2011**, 8, 2512-2514		14
73	Automotive Applications of GaN Power Devices **2011**,		13
72	Effect of p-type activation ambient on acceptor levels in Mg-doped GaN. *Journal of Applied Physics*, **2004**, 96, 415-419	2.5	13
71	Defects in N/Ge coimplanted GaN studied by positron annihilation. *Journal of Applied Physics*, **2002**, 91, 884-886	2.5	13
70	Franz-Keldysh effect in GaN p-n junction diode under high reverse bias voltage. *Applied Physics Letters*, **2018**, 112, 252104	3.4	13
69	Atomic resolution structural analysis of magnesium segregation at a pyramidal inversion domain in a GaN epitaxial layer. *Applied Physics Express*, **2019**, 12, 031004	2.4	12
68	Characterization of hole traps in MOVPE-grown p-type GaN layers using low-frequency capacitance deep-level transient spectroscopy. *Japanese Journal of Applied Physics*, **2019**, 58, SCCB36	1.4	12
67	Shockley□Read□Hall lifetime in homoepitaxial p-GaN extracted from recombination current in GaN p□+ junction diodes. *Japanese Journal of Applied Physics*, **2019**, 58, SCCB14	1.4	12
66	Assignments of optically pumped CH3OD laser lines. *Journal of Infrared, Millimeter and Terahertz Waves*, **1982**, 3, 401-408		12
65	Electrical Properties of Metal□Insulator□Semiconductor Capacitors on Freestanding GaN Substrate. *Japanese Journal of Applied Physics*, **2010**, 49, 04DF08	1.4	11
64	Loss evaluation of an AC-AC direct converter with a new GaN HEMT SPICE model **2011**,		11
63	Effect of Be++O+ coimplantation on Be acceptors in GaN. *Applied Physics Letters*, **2003**, 82, 2082-2084	3.4	11
62	Effect of C and B sequential implantation on the B acceptors in 4H□SiC. *Journal of Applied Physics*, **2001**, 89, 5961-5964	2.5	11

61	Mg-implanted bevel edge termination structure for GaN power device applications. *Applied Physics Letters*, **2021**, 118, 093502	3.4	11
60	Quantitative investigation of the lateral diffusion of hydrogen in p-type GaN layers having NPN structures. *Applied Physics Express*, **2019**, 12, 011006	2.4	11
59	GaN Power Devices for Automotive Applications **2007**,		10
58	n-type AlN layer by Si ion implantation. *Applied Physics Letters*, **2006**, 88, 202106	3.4	10
57	Why do electron traps at E C 0.6 eV have inverse correlation with carbon concentrations in n-type GaN layers?. *Japanese Journal of Applied Physics*, **2020**, 59, 105505	1.4	10
56	Highly reliable AlSiO gate oxides formed through post-deposition annealing for GaN-based MOS devices. *Applied Physics Express*, **2020**, 13, 026504	2.4	10
55	Mg segregation in a (1 1 0 1) GaN grown on a 7 off-axis (0 0 1) Si substrate by MOVPE. *Journal of Crystal Growth*, **2009**, 311, 2883-2886	1.6	9
54	Interface Properties of Al$_{2}$O$_{3}$/n-GaN Structures with Inductively Coupled Plasma Etching of GaN Surfaces. *Japanese Journal of Applied Physics*, **2012**, 51, 060201	1.4	9
53	Excess Carrier Lifetime Measurement for Plasma-Etched GaN by the Microwave Photoconductivity Decay Method. *Japanese Journal of Applied Physics*, **2007**, 46, 35-39	1.4	9
52	Assignments of optically pumped CD3OH laser lines. *Journal of Infrared, Millimeter and Terahertz Waves*, **1983**, 4, 767-777		9
51	Effects of ultra-high-pressure annealing on characteristics of vacancies in Mg-implanted GaN studied using a monoenergetic positron beam. *Scientific Reports*, **2020**, 10, 17349	4.9	9
50	State-of-the-art GaN vertical power devices **2015**,		8
49	Enhanced activation of Mg ion-implanted GaN at decreasing annealing temperature by prolonging duration. *Applied Physics Express*, **2021**, 14, 011005	2.4	8
48	Design and demonstration of nearly-ideal edge termination for GaN p junction using Mg-implanted field limiting rings. *Applied Physics Express*, **2021**, 14, 074002	2.4	8
47	Nitrogen-displacement-related electron traps in n-type GaN grown on a GaN freestanding substrate. *Applied Physics Letters*, **2021**, 118, 012106	3.4	8
46	Improvement of channel property of GaN vertical trench MOSFET by compensating nitrogen vacancies with nitrogen plasma treatment. *Applied Physics Express*, **2020**, 13, 124003	2.4	7
45	Isochronal annealing study of Mg-implanted p-type GaN activated by ultra-high-pressure annealing. *Applied Physics Express*, **2021**, 14, 056501	2.4	7
44	Vertical device operation of AlGaN/GaN HEMTs on free-standing n-GaN substrates **2007**,		6

43	Growth of 3C-SiC Layers on Si Substrates with a Novel Stress Relaxation Structure. *Japanese Journal of Applied Physics*, **2001**, 40, 5907-5908	1.4	6
42	New Approach to Low-Temperature Epitaxial Growth of GaAs by Photostimulated Metalorganic Chemical Vapor Deposition. *Japanese Journal of Applied Physics*, **1988**, 27, L1556-L1558	1.4	6
41	Effect of annealing time and pressure on electrical activation and surface morphology of Mg-implanted GaN annealed at 1300 °C in ultra-high-pressure nitrogen ambient. *Applied Physics Express*, **2021**, 14, 121004	2.4	6
40	Contribution of the carbon-originated hole trap to slow decays of photoluminescence and photoconductivity in homoepitaxial n-type GaN layers. *Journal of Applied Physics*, **2021**, 129, 115701	2.5	6
39	Formation of highly vertical trenches with rounded corners via inductively coupled plasma reactive ion etching for vertical GaN power devices. *Applied Physics Letters*, **2021**, 118, 102101	3.4	6
38	Performance verification of a novel soft switching three-phase utility frequency AC to high frequency AC direct power converter with PFC function for industrial IH applications **2010**,		5
37	n-Type Doping Characteristics of O-Implanted AlGaN. *Journal of the Electrochemical Society*, **2004**, 151, G801	3.9	5
36	N-type implantation doping of GaN. *Materials Science in Semiconductor Processing*, **2003**, 6, 515-517	4.3	5
35	Low-temperature annealing behavior of defects in Mg-ion-implanted GaN studied using MOS diodes and monoenergetic positron beam. *Japanese Journal of Applied Physics*, **2021**, 60, 016502	1.4	5
34	Effects of Dosage Increase on Electrical Properties of Metal-Oxide-Semiconductor Diodes with Mg-Ion-Implanted GaN Before Activation Annealing. *Physica Status Solidi (B): Basic Research*, **2020**, 257, 1900367	1.3	5
33	Resonant gate driver for normally-on GaN high-electron-mobility transistor **2013**,		4
32	Study on post-etching processes for p-type GaN using HAX-PES. *Physica Status Solidi C: Current Topics in Solid State Physics*, **2012**, 9, 927-930		4
31	A quantum structure for high-temperature operation of AlGaAs lasers: Multiple-quantum barrier and multiple-quantum well in active region. *Applied Physics Letters*, **1996**, 68, 3704-3706	3.4	4
30	Experimental test of CH3OH laser line assignments with competitive and cascade couplings. *Infrared Physics*, **1982**, 22, 337-341		4
29	Impacts of high temperature annealing above 1400°C under N2 overpressure to activate acceptors in Mg-implanted GaN **2020**,		4
28	Effects of the sequential implantation of Mg and N ions into GaN for p-type doping. *Applied Physics Express*,	2.4	4
27	Theoretical prediction of a self-forming gallium oxide layer at an n-type GaN/SiO2interface. *Applied Physics Express*, **2018**, 11, 031002	2.4	3
26	Reduction of peak electric field strength in GaN-HEMT with carbon doping layer. *Physica Status Solidi C: Current Topics in Solid State Physics*, **2012**, 9, 915-918		3

25	Effect of C/B sequential implantation on the B acceptors in 4H-SiC. *Journal of Crystal Growth*, **2000**, 210, 283-287	1.6	3
24	Depth profiling of surface damage in n-type GaN induced by inductively coupled plasma reactive ion etching using photo-electrochemical techniques. *Applied Physics Express*, **2020**, 13, 106505	2.4	3
23	Channeled implantation of magnesium ions in gallium nitride for deep and low-damage doping. *Applied Physics Express*, **2021**, 14, 066503	2.4	3
22	Acceptors activation of Mg-ion implanted GaN by ultra-high-pressure annealing **2019**,		2
21	Estimation of Impact Ionization Coefficient in GaN by Photomulitiplication Measurement Utilizing Franz-Keldysh Effect **2019**,		2
20	Experimental validation of newly fabricated normally-on GaN high-electron-mobility transistor **2013**,		2
19	N/Ge Co-Implantation into GaN for N-Type Doping. *Japanese Journal of Applied Physics*, **2002**, 41, 2522-2527	1.4	2
18	Interface Properties of Al2O3/n-GaN Structures with Inductively Coupled Plasma Etching of GaN Surfaces. *Japanese Journal of Applied Physics*, **2012**, 51, 060201	1.4	2
17	X-ray photoelectron spectroscopy study on effects of ultra-high-pressure annealing on surface of Mg-ion-implanted GaN. *Japanese Journal of Applied Physics*, **2021**, 60, 036503	1.4	2
16	GaN devices for automotive application and their challenges in adoption **2018**,		2
15	Dual-color-sub-bandgap-light-excited isothermal capacitance transient spectroscopy for quick measurement of carbon-related hole trap density in n-type GaN. *Japanese Journal of Applied Physics* , **2020**, 59, SGGD05	1.4	1
14	Characterization of Traps in GaN pn Junctions Grown by MOCVD on GaN Substrate Using Deep-Level Transient Spectroscopy. *Materials Science Forum*, **2008**, 600-603, 1297-1300	0.4	1
13	Investigation of diethylarsine as a replacement for arsine in organometallic vapor-phase epitaxy of GaAs. *Journal of Applied Physics*, **1990**, 68, 3750-3752	2.5	1
12	Breakdown Electric Field of GaN p+-n and p-n+ Junction Diodes with Various Doping Concentrations. *IEEE Electron Device Letters*, **2021**, 1-1	4.4	1
11	Inhibition of Mg activation in p-type GaN caused by thin AlGaN capping layer and impact of designing hydrogen desorption pathway. *Applied Physics Express*, **2021**, 14, 071001	2.4	1
10	Photoionization cross section ratio of nitrogen-site carbon in GaN under sub-bandgap-light irradiation determined by isothermal capacitance transient spectroscopy. *Applied Physics Express*,	2.4	1
9	Insight into interface electrical properties of metal-oxide-semiconductor structures fabricated on Mg-implanted GaN activated by ultra-high-pressure annealing. *Applied Physics Letters*, **2022**, 120, 082103	3.4	1
8	Effect of Ultra-High-Pressure Annealing on Defect Reactions in Ion-Implanted GaN Studied by Positron Annihilation. *Physica Status Solidi (B): Basic Research*,2200183	1.3	1

7	High-Temperature Annealing Behavior of p-Type Doping Characteristics in Mg-Doped GaN. *Journal of the Electrochemical Society*, **2004**, 151, G574	3.9	0
6	Impact of channel mobility on design optimization of 600–3300-V-class high-speed GaN vertical-trench MOSFETs based on TCAD simulation. *Applied Physics Express*, **2021**, 14, 094002	2.4	0
5	Atomic-scale investigation of implanted Mg in GaN through ultra-high-pressure annealing. *Journal of Applied Physics*, **2022**, 131, 185701	2.5	0
4	Electrical Characterization of GaN p–i Junctions Grown on Freestanding GaN Substrates by Metal–Organic Chemical Vapor Deposition. *Japanese Journal of Applied Physics*, **2011**, 50, 031005	1.4	
3	Low-pressure metalorganic vapor phase epitaxy of GaAs using monoethylarsine. *Applied Physics Letters*, **1994**, 65, 3374-3376	3.4	
2	Encapsulant-Dependent Effects of Long-Term Low-Temperature Annealing on Interstitial Defects in Mg-Ion-Implanted GaN. *Journal of Electronic Materials*, **2022**, 51, 1731	1.9	
1	Electrical Characterization of GaN p–i Junctions Grown on Freestanding GaN Substrates by Metal–Organic Chemical Vapor Deposition. *Japanese Journal of Applied Physics*, **2011**, 50, 031005	1.4	