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### Administrative Staff

### Student Ambassadors

## Kevin CHEN 陳敬

PhD, *The University of Maryland*

**Associate Head & Professor of Department of Electronic and Computer Engineering**

### Departmental Research Area

Solid-State Electronics & Photonics

### Individual Research Interest

Fabrication, characterization and modeling techniques for RF/microwave semiconductor devices, design of RF/microwave power amplifiers, micromachined RF components.

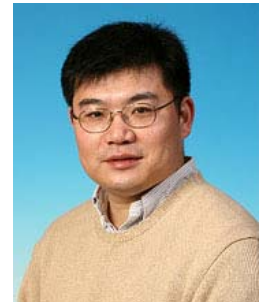
### Biography

Prof Chen received a BS degree in Department of Electronics, Peking University in 1988. On a CUSPEA (China-US Physics Examinations and Applications) fellowship, he went to University of Maryland, College Park, USA, in 1988, and obtained his PhD in 1993. From Jan 1994 to Dec 1995, he was a Research Engineer in NTT LSI laboratories, Atsugi, Japan, engaging in the research and development of functional quantum effect devices and heterojunction FET's (HFET's). In particular, he developed the device technology for monolithic integration of resonant tunneling diodes and HFET's (MISFET and HEMT) on both GaAs and InP substrates, for applications in ultra-high speed signal processing and communication systems. He also developed the enhancement-mode HEMT technology for single polarity voltage supply RF/microwave circuits.

From 1996 to 1998, he was an Assistant Professor in the Department of Electronic Engineering, City University of Hong Kong, carrying out research on high-speed device and circuit simulations. Prof Chen then joined the wireless semiconductor division of Agilent Technologies, Inc. (formerly Hewlett-Packard Co.), Santa Clara, California, in 1999 working on RF power amplifiers used in dual-band GSM/DCS wireless handsets. His work at Agilent covered RF characterization and modeling of microwave transistors, RF IC and package design. Prof Chen joined HKUST in Nov 2000.

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## ***Publications:***

### **Book Chapters**

- **K. J. Chen** and S. Yang, "Recent Progress in GaN-on-Si HEMT," in *HANDBOOK OF GaN SEMICONDUCTOR MATERIALS AND DEVICES*, CRC Press, Taylor & Francis Group, International Standard Book Number-13: 978-1-4987-4713-4 (Hardback). Chapter 11, 2018.
- **K. J. Chen**, "Fluorine-Implanted Enhancement-Mode Transistors" in *Power GaN Devices*, Springer International Publishing, ISBN: 978-3-319-43197-0, Chapter 12, pp. 273-293, 2016.
- **K. J. Chen** and L. L. W. Leung, "CMOS-compatible micromachined edge-suspended planar inductors and coplanar waveguides" in *Si-Based Semiconductor Components for RF Integrated Circuits*, Transworld Research Network, Ed. Will Z. Cai, ISBN: 81-7895-196-7, Chapter 8, pp. 217-242, 2006.

### **Recent Journal Papers (2003-present) ([Full List](#))**

#### **2018:**

- X. Tang, B. Li, **K. J. Chen**, and J. Wang, "Photocurrent characteristics of metal-AlGaIn/GaN Schottky-on-heterojunction diodes induced by GaN interband excitation," *Appl. Phys. Express*, 11, 054101, 2018.
- Q. Qian, Z. Zhang, and **K. J. Chen**, "Layer-dependent second-order Raman intensity of MoS<sub>2</sub> and WSe<sub>2</sub>: influence of intervalley scattering," *Physical Review B*, 97, 165409, 2018.
- **(Invited Paper)** H. Amano, et al., "The 2018 GaN power electronics roadmap, " *J. Phys. D: Appl. Phys.* 51 (2018) 163001.
- Q. Qian, Z. Zhang, and **K. J. Chen**, "In Situ Resonant Raman Spectroscopy to Monitor the Surface Functionalization of MoS<sub>2</sub> and WSe<sub>2</sub> for High-k Integration: A First-Principles Study," *Langmuir*, 34, pp. 2882-2889, 2018. DOI: 10.1021/acs.langmuir.7b03840.
- M. Hua, Q. Qian, J. Wei, Z. Zhang, G. Tang, and **K. J. Chen**, "Bias Temperature Instability of Normally-Off GaN MIS-FET with Low-Pressure Chemical Vapor Deposition SiN<sub>x</sub> Gate Dielectric, " *Phys. Status Solidi A*, 2018, 1700641, DOI: 10.1002/pssa.201700641.
- J. Lei, J. Wei, G. Tang, Z. Zhang, Q. Qian, Z. Zheng, Mengyuan, and **K. J. Chen**, "650-V Double-Channel Lateral Schottky Barrier Diode with Dual-Recess Gated Anode," *IEEE Electron Device Lett.*, *IEEE Electron Device Lett.*, vol. 39, no. 2, pp. 260-263, Feb. 2018.
- M. Hua, J. Wei, Q. Bao, Z. Zhang, Z. Zheng, and **K. J. Chen**, "Dependence of  $V_{TH}$  Stability on Gate-Bias under Reverse-Bias Stress in E-mode GaN MIS-FET," *IEEE Electron Device Lett.*, vol. 39, No. 3, pp. 413-416, 2018, DOI: 10.1109/LED.2018.2791664.
- S. Huang, X. Liu, X. Wang, X. Kang, J. Zhang, J. Fan, J. Shi, K. Wei, Y. Zheng, H. Gao, Q. Sun, M. Wang, B. Shen, and **K. J. Chen**, "Ultrathin-Barrier AlGaIn/GaN

Heterostructure: A Recess-Free Technology for Manufacturing High-Performance GaN-on-Si Power Devices," *IEEE Trans. Electron Devices*, vol. 65, no. 1, pp. 207-214, 2018.

- J. Wei, J. Lei, X. Tang, B. Li, S. Liu, and **K. J. Chen**, "Channel-to-Channel Coupling in Normally-Off GaN Double-Channel MOS-HEMT," *IEEE Electron Device Lett.*, vol. 39, no. 1, pp. 59-62, 2018.
- K. Kim, M. Hua, D. Liu, J. Kim, **K. J. Chen**, and Z. Ma, "Efficiency enhancement of InGaN/GaN blue light-emitting diodes with top surface deposition of AlN/Al<sub>2</sub>O<sub>3</sub>," *Nano Energy*, 43 (2018) 259-269.

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- S. Yang, C. Zhou, S. Han, J. Wei, K. Sheng, and **K. J. Chen**, "Impact of Substrate Bias Polarity on Buffer-Related Current Collapse in AlGaIn/GaN-on-Si Power Devices," *IEEE Trans. Electron Devices*, vol. 64, no. 12, pp. 5048-5056, 2017.
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- **(Invited) K. J. Chen**, S. Yang, Z. Tang, and S. Huang, "Dielectric/III-N interfaces with nitridation interfacial-layer for GaN power electronics," *45th IEEE Semiconductor Interface Specialists Conference (SISC)*, San Diego, USA, Dec. 10-13, 2014.
- S. Yang, and **K. J. Chen**, "Nitridation Interfacial-Layer Technology: Enabling Low Interface Trap Density and High Stability in III-Nitride MIS-HEMTs," *12th International Conferences on Solid-State and Integrated Circuit Technology (ICSICT2014)*, Guilin, China, Oct. 28-31, 2014.
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- S. Liu, S. Yang, Z. Tang, Q. Jiang, C. Liu, M. Wang, and **K. J. Chen**, "Interface Characterization of Normally-Off Al<sub>2</sub>O<sub>3</sub>/AlN/GaN MOS-Channel- HEMTs with an AlN Interfacial Layer," *8th International Workshop on Nitride Semiconductors (IWN 2014)*, Wrocław, Poland, August 24-29, 2014.
- Y. Lu, B. Li, X. Tang, Q. Jiang, S. Yang, Z. Tang, and **K. J. Chen**, "Investigation of Gate Degradation in Al<sub>2</sub>O<sub>3</sub>-AlGaIn/GaN MIS-HEMTs using Transparent Gate Electrode," *8th International Workshop on Nitride Semiconductors (IWN 2014)*, Wrocław, Poland, August 24-29, 2014.

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- S. Liu, S. Yang, Z. Tang, Q. Jiang, C. Liu, M. Wang, and **K. J. Chen**, "Performance Enhancement of Normally-Off Al<sub>2</sub>O<sub>3</sub>/AlN/GaN MOS-Channel-HEMTs with an ALD-Grown AlN Interfacial Layer," *2014 Int. Symp. On Power Semiconductor Devices and ICs (ISPSD'14)*, Waikoloa, Hawaii, USA, June 15-19, 2014.
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- Z. Tang, S. Huang, and **K. J. Chen**, "Stability and Temperature Dependence of Dynamic R<sub>ON</sub> in AlN-Passivated AlGaIn/GaN HEMT on Si Substrate," *CS MANTECH Conference*, Denver, Colorado, USA, May 19-22, 2014. **(Best student paper award)**
- A. Zhang, L. Zhang, Z. Tang, X. Cheng, Y. Wang, **K. J. Chen**, and M. Chan, "Analytical Modeling for AlGaIn/GaN HEMTs," *The 11th International Workshop on Compact Modeling (IWCM 2014)*, Singapore, Jan. 23, 2014.

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- S. Yang, Z. Tang, K. Wong, Y. Lin, S. Huang, and **K. J. Chen**, "Mapping of interface traps in high-performance Al<sub>2</sub>O<sub>3</sub>/AlGaIn/GaN MIS-heterostructures using frequency- and temperature-dependent C-V techniques," *2013 Int. Electron Device Meeting (IEDM 2013)*, Washington, DC, USA, Dec. 9-11, 2013.
- Z. Tang, Q. Jiang, S. Huang, Y. Lu, S. Yang, C. Liu, X. Tang, S. Liu, B. Li, and **K. J. Chen**, "Monolithically Integrated 600-V E/D-Mode SiNx/AlGaIn/GaN MIS-HEMTs and Their Applications in Low-Standby-Power Start-Up Circuit for Switched-Mode Power Supplies," *2013 Int. Electron Device Meeting (IEDM 2013)*, Washington, DC, USA, Dec. 9-11, 2013.
- **(Invited talk) K. J. Chen**, "Toward GaN-based Power Integrated Circuits," *The 2<sup>nd</sup> Int. Conf. on Advanced Electromaterials (ICAE 2013)*, Nov. 12-15, 2013, ICC Jeju, Korea.
- C. Liu, S. Liu, S. Huang, B. Li, and **K. J. Chen**, "AlN/GaN heterostructure TFTs with the polarized AlN barrier grown by 300 °C plasma enhanced atomic layer epitaxy," *10<sup>th</sup> Topical Workshop on Heterostructure Microelectronics (TWHM-10)*, Sep. 2-5, 2013, Hakodate, Japan.
- **(Invited talk) K. J. Chen**, "Technologies for III-N Heterogeneous Mixed-signal Electronics," *10<sup>th</sup> Int. Conf. on Nitride Semiconductors (ICNS-10)*, Washington, DC, USA, Aug. 25-30, 2013.
- B. Li, **K. J. Chen**, Q. Jiang, S. Liu, and C. Liu "Degradation of OFF-state leakage current in AlGaIn/GaN HEMTs induced by an ON-state gate overdrive," *10<sup>th</sup> Int. Conf. on Nitride Semiconductors (ICNS-10)*, Washington, DC, USA, Aug. 25-30, 2013. **(Outstanding poster award)**
- S. Yang, J. Lu, S. Huang, C. Zhou, B. Huang, and **K. J. Chen**, "GaN Buffer Traps in GaN-on-Si Structure Studied by Thermally Stimulated Current and Back-Gating Measurements," *10<sup>th</sup> Int. Conf. on Nitride Semiconductors (ICNS-10)*, Washington, DC, USA, Aug. 25-30, 2013.
- S. Huang, K. Wei, X. Liu, G. Liu, B. Shen, and **K. J. Chen**, "Improved High-Temperature Stability of 2DEG Channel in AlGaIn/GaN Heterostructures by PEALD-



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- Q. Jiang, C. Liu, Y. Lu, and **K. J. Chen**, "High-voltage enhancement/depletion-mode AlGaIn/GaN HEMTs on modified SOI substrates," *2013 Int. Symp. On Power Semiconductor Devices and ICs (ISPSD'13)*, May 26-30, 2013, Kanazawa, Japan. **(Charitat Award: for the best Young Researcher)**
- Z. Tang, S. Huang, Q. Jiang, S. Liu, C. Liu, and **K. J. Chen**, "600 V high-performance AlGaIn/GaN HEMTs with AlN/SiN<sub>x</sub> passivation," *2013 Compound Semiconductor Manufacturing Technology Conference CS MANTECH*, Boston, USA, Apr. 23-26, 2012. **(Best student paper award)**
- Z. Tang, S. Huang, Q. Jiang, S. Liu, C. Liu, and **K. J. Chen**, "600V 1.3mΩ·cm<sup>2</sup> Low-Leakage Low-Current-Collapse AlGaIn/GaN HEMTs with AlN/SiN<sub>x</sub> Passivation," *2013 Int. Symp. On Power Semiconductor Devices and ICs (ISPSD'13)*, May 26-30, 2013, Kanazawa, Japan.
- Q. Zhou, W. Chen, S. Liu, B. Zhang, Z. Feng, S. Cai, and **K. J. Chen**, "High Breakdown Voltage InAlN/AlN/GaN HEMTs Achieved by Schottky-Source Technology," *2013 Int. Symp. On Power Semiconductor Devices and ICs (ISPSD'13)*, May 26-30, 2013, Kanazawa, Japan.
- **(Invited talk) K. J. Chen**, "Device technology for GaN mixed-signal integrated circuits," *5<sup>th</sup> Int. Symp. On Advanced Plasma Science and its Applications for Nitrides and Nanomaterials (ISPlasma2013)*, Jan. 28-Feb. 1, 2013, Nagoya University, Japan.

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- A. M. H. Kwan, X. Liu, and **K. J. Chen**, "Integrated gate-protected HEMTs and mixed-signal functional blocks for GaN smart power ICs," *2012 Int. Electron Device Meeting (IEDM2012)*, San Francisco, USA, Dec. 10-12, 2012.
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- X. Liu, C. Zhan, K. W. Chan, W. Liu, L. S. Tan, **K. J. Chen** and Y.-C. Yeo, "AlGaIn/GaN-on-Sapphire MOS-HEMTs with breakdown voltage of 1400 V and on-state resistance of 22 mW·cm<sup>2</sup> using a CMOS-compatible gold-free process," *2012 International Conference on Solid State Device and Materials (SSDM2012)*, Kyoto, Japan, Sep. 25-27, 2012.
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- X. Liu, C. Zhan, K. W. Chan, W. Liu, L. S. Tan, **K. J. Chen** and Y.-C. Yeo, "AlGaIn/GaN-on-Silicon MOS-HEMTs with Breakdown Voltage of 800 V and On-State Resistance of 3 mΩ·cm<sup>2</sup> using a CMOS-Compatible Gold-Free Process," *2012 Int. Symp. on VLSI Technology, Systems, and Applications (VLSI-TSA)*, Hsinchu, Taiwan, Apr. 23-25, 2012.
- **(Invited) K. J. Chen**, "Fluorine Plasma Ion Implantation: a GaN Normally-off HEMT Technology" *4<sup>th</sup> Int. Symp. On Advanced Plasma Science and its Application for Nitrides and Nanomaterials (ISPlasma2012)*, Aichi, Japan, Mar. 4-8, 2012.

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- Q. Zhou, S. Huang\*, H. Chen, C. Zhou, Z. Feng, S. Cai, **K. J. Chen**, "Schottky Source/Drain Al<sub>2</sub>O<sub>3</sub>/InAlN/GaN MIS-HEMT with Steep Sub-threshold Swing and High ON/OFF Current Ratio", *2011 Int. Electron Device Meeting (IEDM)*, Washington D. C., USA, Dec. 4-7, 2011.
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- H. Chen, L. Yuan, Q. Zhou, C. Zhou, and **K. J. Chen**, "Normally-off AlGaIn/GaN Power Tunnel-Junction FETs," *9<sup>th</sup> Int. Conf. on Nitride Semiconductors (ICNS-9)*, Glasgow, UK, July 10-15, 2011.
- Q. Zhou, H. Chen, C. Zhou, Z. Feng, S. J. Cai, and **K. J. Chen**, "Observation Observation of Trap-Assisted Steep Sub-threshold Swing in Schottky Source/Drain Al<sub>2</sub>O<sub>3</sub>/InAlN/GaN MISHEMT," *69<sup>th</sup> Device Research Conference (DRC)*, Santa Barbara, CA, USA, June 20-22, 2011.



- J. Fu, L. Yobas, and **K.J. Chen**, "Stealth electrode dielectrophoresis: Microsphere manipulation by patterned 2-Dimensional Electron Gas (2-DEG) in AlGaIn/GaN heterostructures," *The 3rd International Symposium on Microchemistry and Microsystems (ISMM)*, Seoul, Korea, June 2-4, 2011, Abstract: F3-056.
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- J. N. Lv, Z. C. Yang, G. Z. Yan, Y. Cai, B. S. Zhang, and **K. J. Chen**, "Characterization of GaN cantilevers fabricated with GaN-on-Si platform," *IEEE MEMS 2011*, Jan. 23-27, 2011, Cancun, Mexico.
- **(Invited) K. J. Chen**, "Role of Fluorine Plasma Ion Implantation in GaN Electron Devices," *SPIE Photonics West Conference, OPTO*, San Francisco, USA, Jan. 22-27, 2011.

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- C. Ma, H. Chen, C. Zhou, S. Huang, L. Yuan, J. Roberts, and **K. J. Chen**, "Reliability of Enhancement-mode AlGaIn/GaN HEMTs under ON-state Gate Overdrive," *2010 Int. Electron Device Meeting (IEDM)*, San Francisco, USA, Dec. 4-7, 2010.
- **(Invited) K. J. Chen** and C. Zhou "GaN Smart Discrete Power Devices," *The 10<sup>th</sup> Int. Conf. on Solid-State and Integrated-Circuit Technology (ICSICT08)*, Shanghai, China, Nov. 1-4, 2010.
- **(Invited) K. J. Chen**, "GaN Smart Power IC Technologies," *IEEE University Government Industry Micro/Nano Symposium (UGIM 2010)*, Purdue University, West Lafayette, IN, USA, June 28-July 1, 2010.
- **(Invited) K. J. Chen**, "Enhancement-mode AlGaIn/GaN HEMT and MIS-HEMT Technology," *The 37<sup>th</sup> Int. Symp. On Compound Semiconductors (ISCS2010)*, Takamatsu Symbol Tower, Kagawa, Japan, May 31-June 4, 2010.
- A. M. H. Kwan, K. -Y. Wong, X. Liu, and **K. J. Chen**, "High-Gain and High-Bandwidth AlGaIn/GaN HEMT Comparator," *2010 Int. Conf. on Solid-State Devices and Materials (SSDM2010)*, Tokyo, Japan, Sep. 22-24, 2010.
- J. Fu and **K. J. Chen**, "Microspheres manipulation and sensing system by AlGaIn/GaN 2DEG," *Int. Workshop on Nitride Semiconductors (IWN2010)*, Tampa, Florida, USA, Sep. 19-24, 2010. (oral presentation)
- S. Huang, H. Chen, and **K. J. Chen**, "Effects of the fluorine plasma treatment on the surface potential and Schottky barrier height of AlGaIn/GaN heterostructures," *Int. Workshop on Nitride Semiconductors (IWN2010)*, Tampa, Florida, USA, Sep. 19-24, 2010. (oral presentation)
- B. K. Li, M. J. Wang\*, **K. J. Chen**, J. N. Wang, "Electroluminescence from forward biased Ni/Au-AlGaIn/GaN Schottky diodes," *The 30<sup>th</sup> Int. Conf. on the Physics of Semiconductors (ICPS 2010)*, Seoul, Korea, July 25-30, 2010. (oral presentation)
- H. Chen, M. Wang\*, and **K. J. Chen**, "Self-Aligned Enhancement-mode AlGaIn/GaN HEMTs Using 25 keV Fluorine Ion Implantation," *The 68<sup>th</sup> Device Research Conference (DRC10)*, University of Notre Dame, South Bend, Indiana, USA, June 21-23, 2010.
- C. Zhou, W. J. Chen\*, E. L. Piner, and **K. J. Chen**, "Self-Protected GaN Power Devices with Reverse Drain Blocking and Forward Current Limiting Capabilities," *The*

22<sup>nd</sup> Int. Symp. on Power Semiconductor Devices and ICs (ISPSD'10), Hiroshima, Japan, June 6-10, 2010 **(Charitat Award: for the best Young Researcher)**

- C. Zhou, W. J. Chen\*, E. L. Piner, and **K. J. Chen**, "AlGaIn/GaN Dual-Channel Lateral Field-Effect Rectifier with Punch-through Breakdown Immunity and Low On-Resistance," *2010 Int. Conf. on Compound Semiconductor Manufacturing Technology (CS MANTECH)*, Portland, Oregon, USA, May 7-10, 2010.
- H. Chen, M. Wang\*, and **K. J. Chen**, "Enhancement-mode AlGaIn/GaN HEMTs Fabricated by Standard Fluorine Ion Implantation," *2010 Int. Conf. on Compound Semiconductor Manufacturing Technology (CS MANTECH)*, Portland, Oregon, USA, May 7-10, 2010.
- J. N. Lv, Z.C. Yang, G.Z. Yan, Y. Cai, B.S. Zhang and **K.J. Chen**, "Residual Stress Characterization of GaN Microstructures Using Bent-Beam Strain Sensors," *The 5th Annual IEEE Int. Conf. on Nano/Micro Engineering and Molecular Systems (IEEE-NEMS 2010)*, Xiamen, China, Jan. 20-23, 2010.

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- B. K. Li, M. J. Wang, **K. J. Chen**, and J. N. Wang, "Electroluminescence from a forward biased Ni/Au-AlGaIn/GaN Schottky diode: evidence of Femi level depinning at Ni/AlGaIn interface," *8th Int. Conf. on Nitride Semiconductors (ICNS-8)*, Jeju, Korea, Oct. 18-23, 2009.
- K. -Y. Wong, W. J. Chen, X. Liu, C. Zhou, and **K. J. Chen**, "GaN Smart Power IC Technology," *8th Int. Conf. on Nitride Semiconductors (ICNS-8)*, Jeju, Korea, Oct. 18-23, 2009.
- M. J. Wang, **K. J. Chen**, C. Cheng, C. D. Beling, and S. Fung, "Modulation of Polarization Induced Electric Field by Fluorine Ions in AlGaIn/GaN Heterostructures Revealed by Positron Annihilation Spectroscopy," *8th Int. Conf. on Nitride Semiconductors (ICNS-8)*, Jeju, Korea, Oct. 18-23, 2009.
- K. -Y. Wong, W. J. Chen, and **K. J. Chen**, "GaN Zero-Bias RF Mixer Using a Lateral Field-Effect Rectifier," *2009 Int. Conf. on Solid-State Devices and Materials (SSDM2009)*, Sendai, Miyagi Japan, Oct. 7-9, 2009.
- Q. Zhou, K. -Y. Wong, W. J. Chen, and **K. J. Chen**, "Zero-Bias Microwave Detectors Using AlGaIn/GaN HEMT-Compatible Lateral Field-Effect Rectifier (L-FER)," *8th Topical Workshop on Heterostructure Microelectronics (TWHM2009)*, Mielparque-Nagano, Nagano, Japan, Aug. 25-28, 2009.
- K. -Y. Wong, W. J. Chen, and **K. J. Chen**, "Integrated Voltage Reference and Comparator Circuits for GaN Smart Power Chip Technology," *2009 Int. Symp. on Power Semiconductor Devices and ICs (ISPSD'09)*, Barcelona, Spain, June 14-17, 2009. **(Charitat Award: for the best Young Researcher)**
- K. -Y. Wong, W. J. Chen, and **K. J. Chen**, "Wide Bandgap GaN Smart Power Chip Technology," *2009 Int. Conf. on Compound Semiconductor Manufacturing Technology (CS Matech'09)*, Tampa, Florida, USA, May 18-21, 2009.

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- W. Chen, K. -Y. Wong, and **K. J. Chen**, "Monolithic Integration of Lateral Field Effect Rectifier with Normally-off HEMT for GaN-on-Si Switch-mode Power Supply

Converters," *2008 Int. Electron Device Meeting (IEDM08)*, San Francisco, USA, Dec. 15-17, 2008.

- M. Wang and **K. J. Chen**, "Source Injection Induced Off-State Breakdown and Its Improvement by Enhanced Back Barrier with Fluorine Ion Implantation in AlGaIn/GaN HEMTs," *2008 Int. Electron Device Meeting (IEDM08)*, San Francisco, USA, Dec. 15-17, 2008.
- L. Yuan, M. Wang, and **K. J. Chen**, "Atomistic Modeling of Fluorine Implantation and Diffusion in III-Nitride Semiconductors," *2008 Int. Electron Device Meeting (IEDM08)*, San Francisco, USA, Dec. 15-17, 2008.
- **(Invited) K. J. Chen**, "Threshold Voltage Control in AlGaIn/GaN HEMTs by Fluorine Plasma Ion Implantation: From Normally-ON to Normally-OFF," *15<sup>th</sup> National Conference on Compound Semiconductor: Materials, Microwave and Optoelectronic Devices*, Guangzhou, China, Dec. 1-2, 2008.
- **(Invited) K. J. Chen**, "Fluorine Plasma Ion Implantation (Treatment) Technology: a New Dimension in GaN Electronic Device Processing," *The 9<sup>th</sup> Int. Conf. on Solid-State and Integrated-Circuit Technology (ICSICT08)*, Beijing, China, Oct. 20-23, 2008.
- W. Chen, K. -Y. Wong, W. Huang, and **K. J. Chen**, "High Temperature Operation of Normally-off AlGaIn/GaN Power HEMTs using CF<sub>4</sub> Plasma Treatment," *The 9<sup>th</sup> Int. Conf. on Solid-State and Integrated-Circuit Technology (ICSICT08)*, Beijing, China, Oct. 20-23, 2008.
- L. Yuan, M. Wang, and **K. J. Chen**, "Molecular Dynamics Simulation Study on Fluorine Plasma Ion Implantation in AlGaIn/GaN Heterostructures," *The 9<sup>th</sup> Int. Conf. on Solid-State and Integrated-Circuit Technology (ICSICT08)*, Beijing, China, Oct. 20-23, 2008.
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- L. Yuan, M. Wang, and **K. J. Chen**, "On the Stability of Fluorine Ions in AlGaIn/GaN Heterostructures: a Molecular Dynamics Simulation Study," *2008 Int. Workshop on Nitride Semiconductors (IWN2008)*, Montreux, Switzerland, Oct. 6-10, 2008.
- K. -Y. Wong, W. Chen, and **K. J. Chen**, "High Temperature Performance of AlGaIn/GaN HEMT-Compatible Lateral Field Effect Rectifier," *2008 Int. Conf. Solid-State Devices and Materials (SSDM08)*, Tsukuba, Japan, Sep. 23-26, 2008.
- L. Yuan, M. Wang, and **K. J. Chen**, "On the Stability of Fluorine Ions in AlGaIn/GaN System: a Theoretical Study," *2008 Int. Conf. Solid-State Devices and Materials (SSDM08)*, Tsukuba, Japan, Sep. 23-26, 2008.
- W. Chen, W. Huang, K. Y. Wong, and **K. J. Chen**, "High-Performance AlGaIn/GaN HEMT-Compatible Lateral Field-Effect Rectifiers," *66th Device Research Conference (DRC)*, Santa Barbara, California, USA, June 22-25, 2008.
- J. Lv, Z. Yang, and **K. J. Chen**, "Fabrication of Suspending GaN Microstructures with Combinations of Anisotropic and Isotropic Dry Etching Techniques," *Proc. Of ASME Nano08*, Clear Water Bay, Hong Kong, Kowloon, Hong Kong, June 3-5, 2008.

- **(Invited) K. J. Chen**, "Core Technologies for III-Nitride Integrated Microsensors," *2008 HKUST Nanotechnology Workshop*, HKUST, Jan 23-25, 2008.

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- C. Yi, R. Wang, W. Huang, T. C. -W. Tang, K. M. Lau, and **K. J. Chen**, "Reliability of Enhancement-mode AlGaIn/GaN HEMTs Fabricated by Fluorine Plasma Treatment," *2007 International Electron Device Meeting (IEDM07)*, Washington D. C., USA, Dec. 10-12, 2007.
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