

Taewoo Kim

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Education

<u>Degree</u>	<u>Year</u>	<u>University</u>	<u>Major</u>
Ph. D.	2008	Gwangju Institute of Science and Technology	Electrical Engineering (Ph. D. dissertation: Study on Impact of the Gate Recess Process for the High Performance InP-based HEMTs, Advisor : Join-In Song)
M.S.	2003	Gwangju Institute of Science and Technology	Electrical Engineering
B.S.	2001	Kumoh National Institute of Technology	Electrical Engineering

Professional Experience

<u>Year</u>	<u>Title</u>	<u>Organization</u>	<u>Location</u>
2021-Present	Associate Professor	School of EE, U. of Ulsan	Ulsan, Korea
2022-Present	Visiting Professor	School of MSE, UT Dallas	Richardson, TX
2017-2021	Assistant Professor	School of EE, U. of Ulsan	Ulsan, Korea
2015-2017	Process Int. Eng.	Samsung Austin Semiconductor	Austin, TX
2013-2015	Senior MTS	SEMATECH INC.	Albany, NY
2011-2013	Member of Tech. Staff	SEMATECH INC.	Austin, TX
2008-2011	Post-Doc. Associate	Massachusetts Institute of Technology	Boston, MA

Research Interests

Advanced Materials and Novel Devices for High-Frequency/Power and Cryogenic Applications

State-of-the-art InGaAs channel High-Electron-Mobility-Transistors (HEMTs)

State-of-the-art AlGaIn/GaN High-Electron-Mobility-Transistors (HEMTs)

“*Heterogeneous*” Integration of III-V/III-Nitride and Si

Electron Beam lithography for sub-10nm gate process

MTTF Analysis depending on temperature and stress

Physical based Large-Signal Modeling for III-V/Nitride device

High-frequency noise/small signal modeling for High-Frequency MMICs

Development and Characterization on III-V interface with ALD films

Novel logic device materials, fabrication, and applications

Cryogenic device measurement and device modeling for Quantum Computing Applications

Awards, Honors and Recognitions

Distinguish Professor in *Research* Award at University of Ulsan, 2020

Distinguish Professor in *Research* Award at University of Ulsan, 2019

Distinguish Professor in *Teaching* Award at University of Ulsan, 2019

Korean Research Foundation Fellowship (2008. 10 ~ 2009.09)

Best Research Award in Gwangju Institute of Science and Technology (GIST), 2008

Selected as a featured paper at IEEE Electronics Letters, 2011

- Given to the paper of "InGaAs HEMT with InAs-rich InAlAs barrier spacer for reduced source resistance". This was published at *IEEE Electronics Letters (EL)* in 2011

Selected as a featured paper at IEEE Electronics Letters, 2012

- Given to the paper of " $L_g = 100$ nm InAs PHEMTs on InP substrate with record high frequency response". This was published at *IEEE Electronics Letters (EL)* in 2012.

Selected as a featured paper at IEEE Electronics Letters, 2012

- Given to the paper of " $L_g = 150$ nm Recessed Quantum-Well In_{0.7}Ga_{0.3}As MOS-HEMTs with Al₂O₃/In_{0.52}Al_{0.48}As composite insulator". This was published at *IEEE Electronics Letters (EL)* in 2012.

Most important publication from the past five years:

- Walid Amir, Ju-Won Shin, Ki-Yong Shin, Jae-Moo Kim, Chu-Young Cho, Kyung-Ho Park, Takuya Hoshi, Takuya Tsutsumi, Hiroki Sugiyama, Hideaki Matsuzaki and **Tae-Woo Kim***, "Performance Enhancement of AlGa_N/Ga_N HEMT via Trap State Improvement using O₂ Plasma," *IEEE Transactions on Electron Device*, 2022
- Walid Amir, Ju-Won Shin, Ki-Yong Shin, Jae-Moo Kim, Chu-Young Cho, Kyung-Ho Park, Takuya Hoshi, Takuya Tsutsumi, Hiroki Sugiyama, Hideaki Matsuzaki and Tae-Woo Kim*, "A quantitative approach for trap analysis between Al_{0.25}Ga_{0.75}N and GaN in high electron mobility transistors," *Scientific Reports (Nature Research Journal)*, Vol. 1, pp. 22401, 2021. <https://doi.org/10.1038/s41598-021-01768-4>
- Md. Mamunur Rahman and Tae-Woo Kim*, "Trap Characterization of Atomic-Layer-Deposited Al-Incorporated HfO₂ Films on In_{0.53}Ga_{0.47}As," *ACS Applied Electronic Materials*, Vol. 3, pp. 4398, 2021. <https://doi.org/10.1021/acsaelm.1c00565>
- Md. Mamunur Rahman, Jun-Gyu Kim, Dae-Hyun Kim, and Tae-Woo Kim*, "Border Trap Extraction with Capacitance-Equivalent Thickness to Reflect the Quantum Mechanical Effect on Atomic Layer Deposition High-k/In_{0.53}Ga_{0.47}As on 300-mm Si Substrate" *Scientific Reports (Nature Research Journal)*, Vol. 9, No. 7, pp. 9861, 2019. <https://doi.org/10.1038/s41598-019-46317-2>
- Hyeon-Bhin Jo, Seung-Won Yun, Jun-Gyu Kim, Ji-Min Baek, In-Geun Lee, Dae-Hyun Kim, Tae-Woo Kim, Sang-Kuk Kim, Jacob Yun, Ted Kim, Takuya Tsutsumi, Hiroki Sugiyama, and Hideaki Matsuzaki, "Sub-30-nm In_{0.8}Ga_{0.2}As Composite-Channel High-Electron-Mobility Transistors With Record High-Frequency Characteristics," *IEEE Transactions on Electron Devices*, Vol. 68, Issue. 4, pp. 2010, 2021. <https://doi.org/10.1109/TED.2020.3045958>
- Jun-Gyu Kim, Hyeon-Bhin Jo, In-Geun Lee, Dae-Hyun Kim and Tae-Woo Kim*, "Impact of sulfur passivation on carrier transport properties of In_{0.7}Ga_{0.3}As quantum-well MOSFETs," *IEEE Journal of the Electron Devices Society*, Vol. 9, pp. 209, Feb. 2021. <https://doi.org/10.1109/JEDS.2021.3056689>