

講演会開催案内

Title: Power GaN Technology — should you be concerned?
Speaker: Prof. Wai Tung Ng
University of Toronto, Electrical and Computer Engineering
Toronto ON Canada

Date & Time: 2017年2月9日（木） 13:00-14:30

Place: 群馬大学 理工学部（桐生キャンパス）総合研究棟 501号室

Abstract:

Recent development in GaN-on-silicon technology has opened up the possibility of implementing high density silicon circuits with wide bandgap power devices.

This seminar starts with a historical account on the development of GaN power devices. This is followed by a quick survey on current state of the art GaN power technologies and applications. In particular, examples on their penetration into the consumer market will be offered. As silicon technology is being pushed to its physical limits, the power electronic industry has been exploring the use of new materials such as SiC and GaN. The last part of this seminar will try to address the potential of GaN-on-silicon technology. The advantages and limitations on how GaN can co-existing with current silicon technology will be given. Finally, we will examine what are the technological hurdles for GaN power technology before it can find its way into our household.

Brief Biography:



Wai Tung Ng is a Professor at The Edward S. Rogers, Sr. Department of Electrical & Computer Engineering, University of Toronto. His current research work covers smart power semiconductor devices and fabrication processes. In particular, his main focus is in the development of power management circuit, integrated SMPS (Switched-Mode Power Supplies), integrated class D audio power amplifiers. After he obtained his Ph.D. degree from the University of Toronto in 1990, Prof. Ng joined Texas Instruments, Dallas TX to work on LDMOS power transistors for automotive applications. He started his academic career with the University of Hong Kong in 1992. In 1993, Prof. Ng joined the University of Toronto and established the Smart Power Integration & Semiconductor Devices Research Group. He was promoted to associate and full professor in 1998 and 2008, respectively. He has extensive experience in working with the industry to modify standard CMOS technology for smart PIC and RF applications. Prof. Ng is the director of the Toronto Nanofabrication Centre, and open access research facility at the University of Toronto. Prof. Ng has also been serving as an associate editor for IEEE Electron Device Letters since 2009.

連絡先： 電気電子 小林春夫

GaN Power Technology

should you be concerned?

Wai Tung Ng

Professor
Director, Toronto Nanofabrication Centre

University of Toronto

The Edward S. Rogers Sr. Department of
Electrical & Computer Engineering
10 King's College Road
Toronto Ontario Canada M5S 3G4
Tel: (416) 978-6249

e-mail: ngwt@vrg.utoronto.ca
web: www.vrg.utoronto.ca/~ngwt



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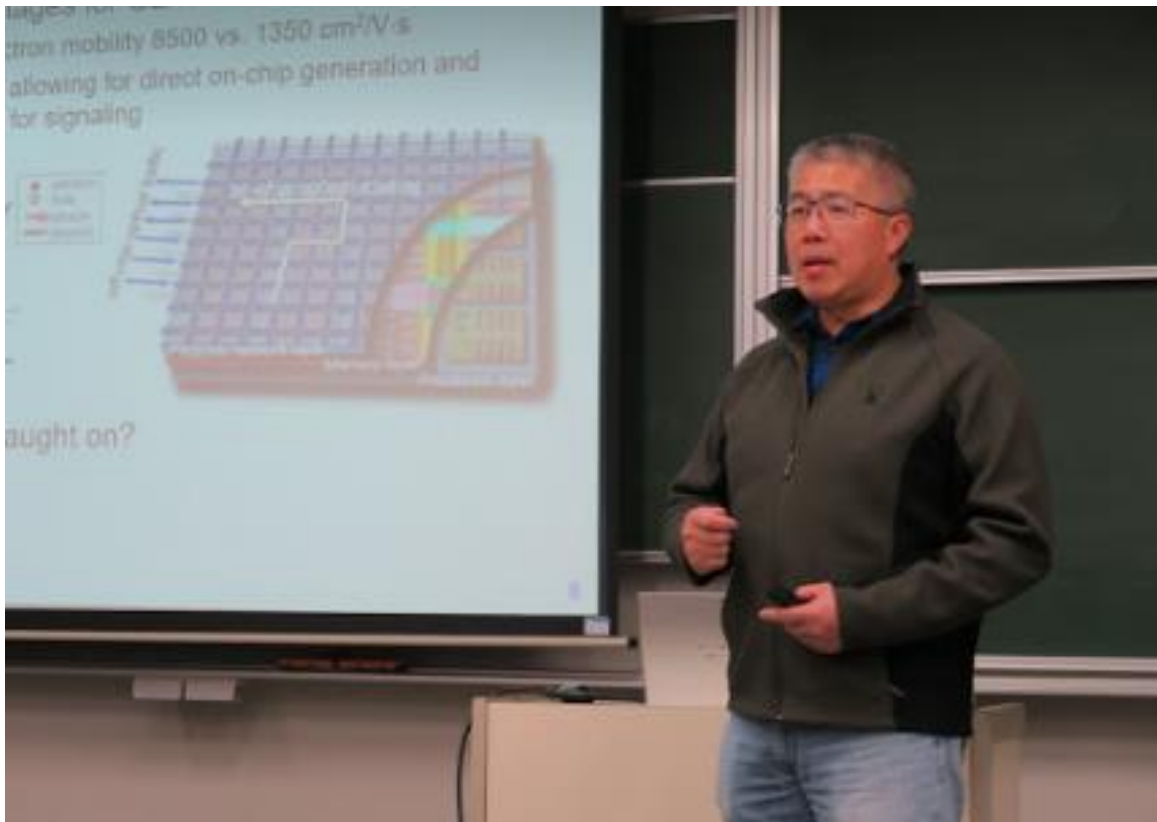
Outline

- What Makes a New Technology Successful?**
- An Overview of GaN Technology**
- Power Device Structures using GaN**
 - GaN-on-Silicon
 - Cascode D-mode vs. E-mode
 - Realistic Advantages over Silicon?
- GaN-based Power Integrated Circuits**
 - GaN-on-Silicon IC Technology
 - Other possibilities
- Conclusions**



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Conclusions

- ▶ Introduced the progress in GaN power device technology
- ▶ Discussed the advantages and limitations of current GaN power devices
- ▶ New fabrication techniques to implement e-mode devices and higher level of integration are constantly being developed
- ▶ Commercialization is happening as we speak
- ▶ Should you be concerned? This time, we think yes!





