



M O H D S Y A M S U L

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C O N T A C T S

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C U R R E N T R E S E A R C H

1. Power electronics of wide bandgap materials (GaN and Diamond).
2. THz applications of 2D materials ie graphene and hexagonal boron nitride (h-BN).
3. Novel sensors of graphene and diamond materials.

P R O F E S S I O N A L P R O F I L E

Focusing on carbon, silicon based devices and nanoparticle synthesis for several applications such as power device and biosensor.

Experienced in commercialisation of product/devices and collaboration with other research institutions.

Recently graduated from Waseda University focusing on simulation, design, structural modifications, fabrication, characterization and reliabilities of diamond based power device.

Outstanding communication skill, great team player and performs well in high pressure work environment.

P U B L I C A T I O N S A N D P A T E N T S

1. **Q1-JOURNAL PAPER** - S. Falina, M. Syamsul, Y. Iyama, M. Hasegawa, Y. Koga and H. Kawarada, "Carboxyl-functionalized graphene SGFET: pH sensing mechanism and reliability of anodization" in Diamond and Related Materials, vol. 91, pp. 15-21, 2019, DOI: 10.1016/j.diamond.2018.11.005
2. **Q1-JOURNAL PAPER** - S. Falina, S. Kawai, N. Oi, H. Yamano, T. Kageura, E. Suaebah, M. Inaba, Y. Shintani, M. Syamsul, and H. Kawarada, "Role of carboxyl and amine termination on boron-doped diamond solution gate field effect transistor for pH sensing," in Sensors, 18(7) 2018, 2178. DOI: 10.3390/s18072178.
3. **Q1-JOURNAL PAPER** - M. Syamsul, N. Oi, S. Okubo, T. Kageura and H. Kawarada, "Heteroepitaxial diamond field effect transistor" in IEEE Electron Device Letters vol. 39, no. 1, pp. 51-54, 2018, DOI:10.1109/LED.2017.2774290
4. **Q1-JOURNAL PAPER** - M. Syamsul, Y. Kitabayashi, K. Takuya, D. Matsumura and H. Kawarada, "High Voltage Stress Induced in Transparent Polycrystalline Diamond Field-Effect Transistor and Enhanced Endurance Using Thick Al₂O₃ Passivation Layer," in IEEE Electron Device Letters, vol. 38, no. 5, pp. 607-610, 2017, DOI: 10.1109/LED.2017.2685081
5. **Q1-JOURNAL PAPER** - M. Syamsul, Y. Kitabayashi, D. Matsumura, T. Saito, Y. Shintani and H. Kawarada, "High voltage breakdown (1.8 kV) of hydrogenated black diamond field effect transistor," in Appl.Phys.Lett., vol. 109, no. 20, pp. 203504, 11/14; 2017/01 2016. DOI: 10.1063/1.4967999
6. **Q1-JOURNAL PAPER** - Y. Kitabayashi, T. Kudo, H. Tsuboi, T. Yamada, D. Xu, M. Shibata, D. Matsumura, Y. Hayashi, M. Syamsul, M. Inaba, A. Hiraiwa, and H. Kawarada, "Normally-off C-H Diamond MOSFETs with Partial C-O Channel Achieving 2-kV Breakdown Voltage," in IEEE Electron Device Lett., vol. 38, no. 3, pp. 363 - 366 , 2017. DOI: 10.1109/LED.2017.2661340.
7. **PATENT** - Japan Patent Office (JP)
Inventor: Mohd Syamsul Nasyriq
Patent No.: [2017-045897 \(P2017-045897A\)](#)
Invention: "ダイヤモンド電界効果トランジスタ及びその製造方法"
(Diamond field effect transistor fabrication)
Release date: March 2, 2017 (2017.3.2)



RECOGNITIONS

1. INVITED TALK - "Diamond and Nitride Power Devices Future Crossover", Mohd Syamsul, 13th New Diamond and Nano Carbon Conference (NDNC 2019), Hualien, Taiwan, May 2019
2. INVITED TALK - "Exploring the potential of heteroepitaxial diamond as field effect transistor", Mohd Syamsul and Hiroshi Kawarada, European Materials Research Fall Meeting (E-MRS 2018), Warszawa, Poland, September 2018
3. INVITED TALK - "High voltage diamond power devices for next generation power electronics applications", Mohd Syamsul, Malaysian Nanotechnology Olympiad 2017, Malaysia, October 2017
4. INVITED JUDGE - "National Nanotechnology Innovations 2018 (PIN 18) ", MESTECC's National Nanotechnology 2018
5. INTERNATIONAL RECOGNITION - Semiconductor Today Highlights (UK) "Black polycrystalline diamond transistors with high breakdown." 25 November 2016. [Link](#)
6. AWARD - "WASEDA University Young Doctoral Scholarship Award", 2014 - 2017
7. AWARD - "Best Dissertation Award 2010", Malaysia Solid State Science and Technology (MASS)

RESEARCH ACTIVITIES

1. *International Conference on New Diamond and Nano Carbons. NDNC 2018. Flagstaff, Arizona, 20 May - 24 May 2018.*
"Solution Giant Gate Graphene FET (SG3FET) pH Sensor."
2. *MRS Fall Meeting & Exhibit 2017 (MRS 2017), Massachusetts, United States of America. Nov. 26-Dec. 1, 2017*
"Device Simulation of Several C-H MOSFETs Diamond Substrates via Two-Dimensional Negatively Charged Sheet Model"
3. *International Conference on New Diamond and Nano Carbons. NDNC 2017. Cairns, Australia, 28 May - 1 June 2017.*
"Heteroepitaxial diamond field effect transistor for high voltage applications."
4. *International Conference on Solid State Devices and Materials, Tsukuba, Japan. 26-29 September, 2016.*
"Planer Diamond P-channel MOSFETs with Breakdown Voltage $V_B > 1.8\text{kV}$ and High Drain Current Density by 2DHG"
5. *International Conference on Diamond and Carbon Materials 2016 (DCM 2016), Montpellier, France. 28 May - 1 June 2016.*
"High endurance transparent polycrystalline diamond FET for power electronics application"
6. *Nano Korea 2016, Gyeonggi-do, South Korea. 13 - 15 July 2016.*
"Cost effective white polycrystalline diamond FET using 2D hole gas"
7. *MRS Fall Meeting & Exhibit 2015 (MRS 2015), Massachusetts, United States of America. Nov. 29-Dec. 4, 2015.*
"High Voltage Breakdown 1.8 kV Hydrogenated Black Diamond Field Effect Transistor"
8. *Japan Society of Applied Physics, 76th Autumn Meeting 2015, (JSAP 2015), Nagoya, Japan. 13-16 September 2015.*
"Hydrogenated Black Diamond FET with high voltage breakdown of 1.8kV"
9. *MRS Fall Meeting & Exhibit 2014 (MRS 2014), Massachusetts, United States of America. Nov. 30-Dec. 5, 2014*
"Fabrication of Diamond Rods for Power Device Application"

AFFILIATION

VISITING RESEARCHER, WASEDA
UNIVERSITY, JAPAN

EUROPEAN MATERIAL RESEARCH
SOCIETY

MATERIAL RESEARCH SOCIETY

JAPAN SOCIETY OF APPLIED
PHYSICS

EDUCATION

Ph.D, Nanoscience and
Nanoengineering
Waseda University, Japan
2014-2017

MSc, Nanoelectronic
Engineering
Universiti Malaysia Perlis
(UniMap), Malaysia
2011-2013

BEng (Hons), Microelectronic
Engineering
Universiti Malaysia Perlis
(UniMap), Malaysia
2005-2009



RESEARCH ACTIVITIES (CONTINUED)

LANGUAGE

ENGLISH
Fluent

JAPANESE
Basic

10. *International Conference on Nanotechnology 2011 (ICONT 2011), Malaysia. 6-9 June 2011.*
11. *International Conference on Enabling Science and Nanotechnology 2010 (ESCI 2010), Malaysia. 1 -3 December 2010.
"Dispersion and Integration of SWNT for Carbon Nanotube based biosensor"*
12. *International Conference on Solid State Science and Technology 2010 (ICSST 2010), Malaysia. 1-3 November 2010.
"Optimization of Carbon Nanotube based biosensor for medical diagnostics application"*
13. *International Postgraduate Conference 2010 (IPCE 2010), Malaysia. 16-17 October 2010.
"Development of Carbon Nanotube based Biosensor"*
14. *International Workshop and Conference on Nanotechnology 2010 (IWCN 2010), Malaysia. 25 – 27 January 2010.
"Development of Carbon Nanotube based biosensor design"*
15. *IEEE Regional Symposium on Micro and Nanoelectronics 2009, Malaysia. 10-12 August 2009. "Comparison of MOS Capacitor using TCAD"*

REFERENCES



Prof. Dr Hiroshi Kawarada
Professor,

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ADVANCED SCIENCE AND
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EXPERIENCES

Postdoctoral Researcher

*Kawarada Laboratory (川原田 洋 研究室),
Faculty of Advanced Science and Engineering, Waseda University Japan
(早稲田大学) / - Oct 2017 – Oct 2018*

Project: Graphene/diamond based biosensor

With the collaboration of National Institute of Advanced Industrial Science and Technology (AIST), LG Japan Lab Co., Ltd., and Waseda University Japan, we further discover the potential of graphene as biosensor.

Visiting Scientist

*Kawarada Laboratory (川原田 洋 研究室),
Faculty of Advanced Science and Engineering, Waseda University Japan
(早稲田大学) / - April 2017 - September 2017*

Project: High temperature operations and degradation of diamond FET

Doctoral Researcher and Teaching Assistant

*Kawarada Laboratory (川原田 洋 研究室),
Faculty of Advanced Science and Engineering, Waseda University Japan
(早稲田大学) / April 2014 - March 2017*

Project: High voltage field effect transistors via heteroepitaxial and polycrystalline diamonds

Researcher

*SIRIM Berhad
November 2010 - April 2014*

Project:

1. "Development of Electrochemical Biosensor for Detection of Food Borne Pathogens"
2. "Surface Plasmon Resonance study of Nano Gold Functionalize Amide by Sonochemical Reaction"