JEUPISTE/Osaka University WBG-i symposium on Power Electronics

Dec 15/16, 2015

organized by
JEUPISTE (Japan-EU Partnership in Innovation, Science and Technology)/Osaka University
supported by ECPE, JEITA, JPCA, JIEP and WBG-i

Hosted at the Delegation of the European Union to Japan
4-6-28 Minami-Azabu, Minato-ku, Tokyo 106-0047

Scope:

Power semiconductors have been providing one solution for the global energy crisis through excellent energy efficiency in industry as well as in consumer appliances. Power Electronics research is an area where the EU and Japan can widen their cooperation in order to tackle common challenges. This symposium aims to foster EU-Japan cooperation on components technologies and will give attention to the EU-Japan cooperation potential in relation to Horizon 2020, the biggest EU Research and Innovation programme ever with nearly €80 billion of funding available over seven years (2014-2020) and open to participation from all over the world.

In particular, wide bandgap (WBG) semiconductors materials such as SiC and GaN allow power electronic components to be smaller, faster, more reliable, and much more efficient than the conventional Si power devices. WBGs will accelerate widespread use of electric, hybrid and fuel cell vehicles and will reduce energy consumption in the cloud network for the Internet of Things. They will also promote integrating renewable energy in the electric grid. Thus, power electronics, especially WBGs, are expected to play key roles in widespread areas. In order to establish and to promote this new technology in the world, the most advanced technologies in WBGs should be synchronized on an international level. The system integration technology and knowledge, especially interconnect technology, born in the EU and in Japan for power electronics can be the new generation world standards to tackle the world's energy challenges and to secure a sustainable and safe environment. This symposium will focus on the European and Japanese Power Electronics technology research and development and will show the latest advancement and the required key technologies.

Program:

DAY 1: "EU-Japan Cooperation in the Area of Next Generation Power Electronics Devices"

Dec. 15, Tuesday
Chairman: Prof. Suganuma

Time	Title	Speaker	Affiliation
10:00	Welcome & Opening remarks	H.E. Viorel Isticioaia-Budura	Ambassador of the European Union to Japan
10:05		Prof. Y. Yagi	Executive Vice President of Osaka U
Welcome speech			
10:10-10:25	Welcome speech & EU-Japan STI cooperation	Dr. L. Karapiperis	Minister-Counsellor, Head of S&T Section, Delegation of the European Union to Japan
10:25-10:40	Welcome speech and R&D of green technology in Japan (tentative)	Mr. T. Hoshino	Deputy Director-General for Industrial Science and Technical Regulations, Standards and Conformity Assessment Policy, METI
R&D cooperation on power electronics and components technologies in the EU and Japan			
10:40-11:00	Horizon 2020 and EU-Japan cooperation	Mr. S. Lambrecht	EU-Japan Centre for Industrial Cooperation
11:00-11:30	Power Electronics in Europe: Opportunities for EU-Japan cooperation	Dr. L. Karapiperis	The Delegation of the EU to Japan
11:30-12:00	JST Super Cluster Program - Industry-Academia Collaborative R&D Program on SiC & GaN Power Electronics -	Dr. A. Suzuki	JST

Lunch break

Chairman: Prof. Ogura

Power electronics developments and expectations			
13:00-13:20	Power Devices- A Driving Technology for Power Electronics Development The Role of ECPE	Prof. L. Lorenz	ECPE
13:20-13:40	Next Generation Power Electronics for Hybrid Vehicles	Mr. K. Toda	Toyota
13:40-14:00	Opportunities and Expectations for Future Power Electronics for MV Applications	Dr. F. Canales	ABB (Switzerland)
14:00-14:20	Progresses in technologies of power supply system and power devices to reduce power consumption of ICT equipment	Dr. Y. Akiyama	NTT laboratory

Coffee break

Chairman: Prof. Asada

15:00-15:20	Development of Humanoid Robot ASIMO	Mr. S. Shigemi	Honda R&D
15:20-15:40	Power Electronics - The systems perspective	Mr. A. Donat	Siemens (Germany)
15:40-16:00	R&D Activities at AIST/TIA-nano on future power electronics using WBG semiconductors	Dr. H. Okumura	AIST
16:00-16:20	Wide band gap activities at Infineon	Dr. P. Friedrichs	Infineon (Germany)

16:20-17:20	Panel discussion and Q&A "What are the key facets for realizing next generation power electronic devices and EU-Japan cooperation in this area?"	Prof. L. Lorenz & Prof. T. Funaki	ECPE/Osaka U.

At the end of each session, there is the possibility for the audience to ask questions.

DAY 2: “WBG Power Devices with Advanced Interconnects for Green Technology”

WBG semiconductors and modules			
9:40-10:00	Development of SiC power devices and modules in Rohm	Dr. H. Asahara	Rohm
10:00-10:20	The Latest Power Module Packaging Technology for SiCs and New IGBTs	Dr. Y. Takahashi	Fuji Electric
10:20-10:40	The WBG limiting factors for automotive applications	Mr. J.-M. Morelle	Valeo (France)

Coffee break

Chairman: TDB

11:00-11:20	DENSO R&D Activities on SiC Power Devices for Automotive Applications	Mr. K. Tsuruta	DENSO
11:20-11:40	WBG of STMicroelectronics	Dr. N. Abbate/Dr. B. Rauscher	STMicroelectronics (Italy)
11:40-12:00	GaN-based Gate Injection Transistors for Power Switching Applications	Dr. M. Ishida	Panasonic
12:00-12:20	High Performance Joining Techniques for WBG Modules	Dr. M. Guyenot	Bosch (Germany)

Lunch Break

Chairman: TDB

Bonding materials & technology			
13:20-13:40	A Compact Smart and Reliable SiC-based Power Inverter for Automotive Applications	Dr. K. Brinkfeldt	Swerea IVF (Sweden)
13:40-14:00	HT lead-free and sinter materials	Mr. M. Ueshima	Senju Metals
14:00-14:20	Interconnect Materials and Systems for WBG Semiconductors	Mr. A. Miric	Heraus (Germany)
14:20-14:40	The Aluminum Direct Cooling Device for the Power semiconductor	Mr. K. Minami	Showa Denko

Coffee break

Chairman: TDB

Reliability and process			
15:10-15:30	Reliability Investigations on WBG Power Switches for Green Energy Applications	Prof. F. Iannuzzo	Aalborg University (Denmark)
15:30-15:50	Reliability Issues for New Generation Power Electronics	Dr. H. Ohashi	NPERC-J
15:50-16:10	Power Cycling Test Methods	Prof. J. Lutz	TU Chemnitz (Germany)

16:10-16:50	Panel discussion and Q&A “What will make a breakthrough to establish standard materials/designs for WBG in EU-JP cooperation?”	Mr. A. Donat & Mr. K. Wilke & Prof. Suganuma	Siemens/Osaka U
16:50-17:00	Closing remark	Prof. Suganuma	Osaka University

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WBG-i: **W**ide **B**and **G**ap Power Devise System **I**ntegration Consortium of Osaka University