Japan- Korea Joint Technical Workshop on Semiconductor Power Converter

**Date**  
October 21 (Friday) 2011  14:00-18:00  
October 22(Saturday) 2011  8:30-18:00

**Venue**  
Fukuoka University Seminar House (Oct. 21st and 22nd )  
3·4·20, Ropponmatsu, Tyuouku, Fukuoka, Fukuoka  
TEL : 092-751-8141  
http://www.adm.fukuoka-u.ac.jp/fu811/home1/seminar/index.html

**Sponsored by**  
Semiconductor Power Converter (SPC) Technical Committee  
Industry Applications Society, IEE of Japan  
Korean Institute of Power Electronics (KIPE)

**Co-Sponsored by**  
IEEE PELS Fukuoka Chapter  
Kyushu Chapter, IEE of Japan

**Subject:**  
General semiconductor power converters

**Program**  
1st session  October 21 (Friday)  14:00-16:00

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>14:00-14:15</td>
<td>Opening ceremony</td>
<td>Chair Toshihsa Shimizu (Tokyo Metropolitan University)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Jaeho Choi (Chungbuk National University)</td>
</tr>
<tr>
<td>14:15-14:45</td>
<td>Recent Status and Trend of Research on Power Electronics in Japan</td>
<td>○ Yukihiko Sato (Chiba University)</td>
</tr>
<tr>
<td>IEEJ-SPC-01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14:45-15:15</td>
<td>Smart Grid Development in Taiwan — Toward a Sustainable Future —</td>
<td>Chia-Chi Chu (National Tsing Hua University)</td>
</tr>
<tr>
<td>IEEJ-SPC-02</td>
<td></td>
<td>Faa-Jeng Lin (National Central University)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>○ Po-Tai Cheng (National Tsing Hua University)</td>
</tr>
<tr>
<td>15:15-15:45</td>
<td>Emerging Technologies for Multilevel Converters in Japan</td>
<td>○ Hideaki Fujita (Tokyo Institute of Technology)</td>
</tr>
<tr>
<td>IEEJ-SPC-03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15:45-16:00</td>
<td>Coffee Break</td>
<td></td>
</tr>
</tbody>
</table>
2nd session  October 21 (Friday)  16:00-18:00
Chair: Tomoki Yokoyama (Tokyo Denki University)
Hag-Wone Kim (Chungju National University)

16:00-16:30  Parallel Operation of Trans-Z-Source Inverter
KIE-P-SPC-01  Honnyong Cha,
○Sanghyup Han, Heung-Geun Kim (Kyungpook National University)
    Dong-Wook Yoo (Korea Electrotechnology Research Institute) ……… 17

16:30-17:00  Evaluation of Power Density and Efficiency Limit for Multilevel Converters
KIE-P-SPC-02  ○Jun-ichi Itoh, Yugo Kashihara (Nagaoka University of Technology) ……… 23

17:00-17:30  A Novel Dummy Load for 40W Fluorescent Lamp
KIE-P-SPC-02  ○Bohwan Choi, Hyunjae Kim, Inyong Yeo (KAIST)
    Bongchel Kim (OPTOMIND Company)
    Chun-Taek Rim (KAIST) ……… 29

17:30-18:00  Single Independent DC Voltage Source Driving of Cascaded H-bridge Multilevel Inverter
KIE-P-SPC-03  Using Flyback Converter with Multiple Secondary of Transformer
    ○Cheol-soon Kwon,
    Seong Hye Kim, Feel-soon Kang (Hanbat National University) ……… 35

Presentation time: 25 minutes and 5 minutes for discussion.

Poster session I  October 22 (Saturday)  8:30-10:00
Chair Junnosuke Haruna (Tokyo University of Science)
Cheewoo Lee (Kyungsung University)

KIE-P-SPC-05  Experimental Verification of Induced Noise Voltage on Laminated Bus Bar Structure
    ○Zen-nosuke Ariga, Keiji Wada (Tokyo Metropolitan University) ……… 39

KIE-P-SPC-04  Comparative Study of PI and Fuzzy Controller for Double-Fed Induction Generator
    ○Fajar Sastrowijoyo, Jaeho Choi (Chungbuk National University) ……… 41

KIE-P-SPC-06  Line Loss Minimization in a Loop Distribution System using a Matrix Converter
    ○Hidehiko Nakazawa, Takaharu Takeshita (Nagoya Institute of Technology)……… 45

KIE-P-SPC-05  Multi-level Inverter Capable of Power Factor Control with DC Link Switch
    ○Ho-Dong Sun,
    Honnyong Cha, ○Heung-Geun Kim (Kyungpook National University)
    Tae-Won Chun (University of Ulsan)
    Eui-Cheol Nho (Pukyong National University) ……… 49

KIE-P-SPC-07  Experimental Discussions on Inductor Current Balance Control for Interleaved Boost Converter
    ○Tomohiro TAKAYANAGI
    Nobukazu HOSHI, Junnosuke HARUNA (Tokyo University of Science)
    Meifen CAO (Toyko Metropolitan College of Industrial Technology) ……… 55
<table>
<thead>
<tr>
<th>Conference</th>
<th>Title</th>
<th>Authors</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>KIPE-SPC-06</td>
<td>Advanced 4-level Switching Topology for the High Speed SRM</td>
<td>Geun-min Lim, Seung-Ho Baek, Jong-Hun Lee, Jin-Woo Ahn, Dong-Hee Lee (Kyungsung University)</td>
<td>59</td>
</tr>
<tr>
<td>IEEJ-SPC-08</td>
<td>Considerations on Adjustable Dead-Time Controlled Three-Phase Resonant Snubber Inverter</td>
<td>Hiroshi HAYAMA, Nobukazu HOSHI, Junnosuke HARUNA (Tokyo University of Science)</td>
<td>63</td>
</tr>
<tr>
<td>KIPE-SPC-07</td>
<td>Design and Analysis of the 2-Phase 4/5 poles SRM</td>
<td>So-yeon Ahn, Marrully Tanujaya, Dong-Hee Lee, Jin-woo Ahn (Kyungsung University)</td>
<td>67</td>
</tr>
<tr>
<td>IEEJ-SPC-09</td>
<td>Peak Voltage Clamping of Class E Power Amplifier Using a Diode</td>
<td>Masahiro Kawazoe, Futoshi Akahoshi, Tadashi Suetsugu (Fukuoka University)</td>
<td>71</td>
</tr>
<tr>
<td>KIPE-SPC-08</td>
<td>Step-up Converter Employing an Output Terminal of Capacitor and Battery in Series</td>
<td>Sun Pil Kim, Jin Sung Choi, Feel-soon Kang (Hanbat National University)</td>
<td>73</td>
</tr>
<tr>
<td>IEEJ-SPC-10</td>
<td>Experimental Verification on Precise Calorimetric Power Loss Measurement Using Two Chambers</td>
<td>Atsushi Nigorikawa, Yuki Nakata, Koji Orikawa, Jun-ichi Itoh (Nagaoka University of Technology)</td>
<td>77</td>
</tr>
<tr>
<td>KIPE-SPC-09</td>
<td>Modified Phase Disposition Switching Scheme for Cascaded H-bridge Multilevel Inverter</td>
<td>Jin Sung Choi, Sun Pil Kim, Feel-soon Kang (Hanbat National University)</td>
<td>79</td>
</tr>
<tr>
<td>IEEJ-SPC-11</td>
<td>DC-DC converter current measurement by using FET on-state resistance</td>
<td>Noriyuki Kimura, Yoshinori Sakoda, Toshimitsu Morizane, Hideki Omori (Osaka Institute of Technology)</td>
<td>83</td>
</tr>
<tr>
<td>KIPE-SPC-10</td>
<td>Cascaded H-bridge Multilevel Inverter Employing a Front-end Modified Buck-boost Converter</td>
<td>Seong Hye Kim, Cheol-soon Kwon, Feel-soon Kang (Hanbat National University)</td>
<td>89</td>
</tr>
<tr>
<td>IEEJ-SPC-12</td>
<td>Parameter Optimization of Wireless Power Transmission Based on Electrical Equivalent Circuit and Efficiency Analysis of HF Based Rectifier</td>
<td>Toru Anazawa, Atsuo Kawamura (Yokohama National University)</td>
<td>93</td>
</tr>
<tr>
<td>KIPE-SPC-11</td>
<td>Digital Control Circuit for Buck-Boost DC-DC Converter with Boundary Current Mode</td>
<td>Kota Ueno, Fujio Kurokawa (Nagasaki University)</td>
<td>99</td>
</tr>
</tbody>
</table>
Poster session II October 22 (Saturday)  10:00-11:30

Chair: Keiji Wada (Tokyo Metropolitan University)
Dong-Hee Lee (Kyungsung University)

KIPE-SPC-12 Utilization of Magnetic Equivalent Circuit in Analyzing a Switched Reluctance Motor
Jeongwon Jeong, Cheewoo Lee (Kyungsung University)  103

IEEJ-SPC-14 Improvement of Regulation Range of DC-DC Converter
○Shun Higuchi,
Akihiro Nakamura, Fujio Kurokawa (Nagasaki University)  109

KIPE-SPC-13 The Correlation between SVPWM and Carrier-based PWM in a Three-to-Five Phase Indirect Matrix Converters
Tuyen D. Nguyen, ○Hong-Hee Lee (University of Ulsan)  111

IEEJ-SPC-15 Simulation of a Power Conditioning System for PV with EV Battery Using MATLAB/Simulink
○Yu Nakashima, Shohei Tokunaga, Katsumi Kesamaru (Kyushu University)  117

KIPE-SPC-14 High-Efficiency and Low-Cost Design of a Small-Size Electric Vehicles Driven by DC Motors
H. G. Kim (Kyungpook University)
E. C. Nho (Pukyong National University)  121

IEEJ-SPC-16 Integrated inverter construction and its control method for Electronics Motor
○Takanori Nagai, Kan Akatsu (Shibaura Institute of Technology)  127

KIPE-SPC-15 An MRAS based Current Harmonics Reduction for Three Phase PWM Rectifier under the Input Voltage Unbalanced and Distorted Condition
○Hee-Keun Shin,
Hag-Wone Kim, Kwan-Yuhl Cho (Chungju National University)  131

IEEJ-SPC-17 Experimental characteristics of current source inverter for multi phase SR motor drive
○Gaku Ando, Kan Akatsu (Shibaura Institute of Technology)  135

KIPE-SPC-16 A Deterioration Diagnosis Method of Film Capacitors in LCL-filter of Grid-connected PWM Converter
○Jang Sik Kim, Hwa Woong Yoo,
Dong Youn Kim, Jang Mok Kim (Pusan National University)  139

IEEJ-SPC-18 Reduction Method of Recovery Current in a Bi-directional Chopper
○Yusuke Fujita,
Satoshi Miyawaki, Jun-ichi Itoh (Nagaoka University of Technology)  143
KIEE-SPC-17 Improved Voltage Drop Characteristics of Transformer-based Voltage Disturbance Generator
○Eui-Cheol Nho, In-Dong Kim (Pukyong National University)
Heung-Geun Kim (Kyungpook National University)
Tae-Won Chun (University of Ulsan)
Byung Moon Han (Myongji University) ..........147

IEEJ-SPC-19 A study of deadbeat control for IPMSM with FPGA hardware controller
○Yuta Hori, Yusuke Tajima, Tomoki Yokoyama (Tokyo Denki University) ..........153

IEEJ-SPC-20 Comparison of Micro Controller suitable for Power Electronics Controller with DRP Processor
Yushi Fujiyama,
○Shinji Fujita, Tomoki Yokoyama (Tokyo Denki University) ..........157

IEEJ-SPC-21 Novel Recovery-less Boost Chopper using Saturable Inductor
○Hideharu Tsukamoto,
Takahiro Kawashima, Masayoshi Yamamoto (Shimane University) ..........163

IEEJ-SPC-22 Active Dischargeable Gate Drive Circuit Suitable for GaN-FET
Yu Nozaki,
○Fumiya Hattori, Masayoshi Yamamoto (Shimane University)
Osamu Machida (SANKEN ELECTRIC) ..........165

IEEJ-SPC-23 A new power converter using one-pulse switching active capacitor (OPSAC) and its applications
Yuki Chiku,
○Hirohito Funato, Hiroya Kobayashi (Utsunomiya University) ..........167

IEEJ-SPC-24 A Disaster-Prevention-Type Smart House
○Hayato Yamauchi, Kosuke Uchida,
Atsushi Yona, Tomonobu Senju (University of the Ryukyu)
Toshihisa Funabashi (Meidensha Corporation) ..........169

11:30-11:45 Closing ceremony

* Poster presentation: size : A0 (841 x 1189mm) 1 page.

12:15 Transfer bus for technical visit (Lunch box in Bus)

15:00-16:00 Technical visit
Kyusyu electric power co. Inc. Hattyobaru geothermal Power Plant
http://www.kyuden.co.jp/effort_geothermal_t_hattyobaru.html

16:15 Transfer bus for Hotel
18:00-19:00 Special session (Aso Plaza hotel)
Education for Power Electronics
**Registration Fee**

- Full Conference Registration 60,000 Yen
  - Including Technical conference (¥30,000), Travel expense (¥4,000) for the technical visit and stay in Aso (¥8,000), Participation fee for Technical visit and Special session (¥18,000).
- Student Registration 5,000 Yen (Only for the technical session)
- Only technical conference Registration 30,000 Yen

*Registration Fee MUST be paid by only **Cash** (Japanese yen)*

**Contacts**

Prof. Junichi Itoh e-mail: itoh(at)vos.nagaokaut.ac.jp
Prof. Kan Akatsu e-mail: akatsu(at)sic.shibaura-it.ac.jp

* Please replace (at) with @ when you send an email to the above address.