History・Organization About Green Electronics Research Projects of ICSEAD

History

Sep.2009 Advanced Power Devices Reliability Committee*1) was established.
Mar.2010 Research Group was established.
Nov.2010 Research Projects was established.
Feb.2012 AIST, KYUTECH and City of Kitakyushu have concluded a partnership agreement.
Apr.2012 Project research resources have been enhanced.
(Visiting research professor adopted)
Oct.2013 Research system of the project research resources have been enhanced.
(Visiting research associate adopted)

*1) Current member companies:

Toyota Motor Corporation,Honda R&D Co.,Ltd.,
Panasonic Corporation,Toshiba Corporation, Mitsubishi Electric Corporation,
Fuji Electric Co.,Ltd., Yaskawa Electric Corporation

PR

"Workshop on Reliability Science for Future Ubiquitous Power Electronics"
(Held once every year since 2010)

"The seminar by AIST, KYUTECH, Kitakyushu (ICSEAD)"
Kitakyushu Science and Research industry-university cooperation in Fair
(Held once every year since 2011)

◆Project Leader

- **Hiromichi Ohashi** (Adviser for Research, City of Kitakyushu)
  1999 Purple Ribbon Medal
  2001 ISPSD Contributory Award、IEEJ/IEEE and more

◆Sub Project Leader

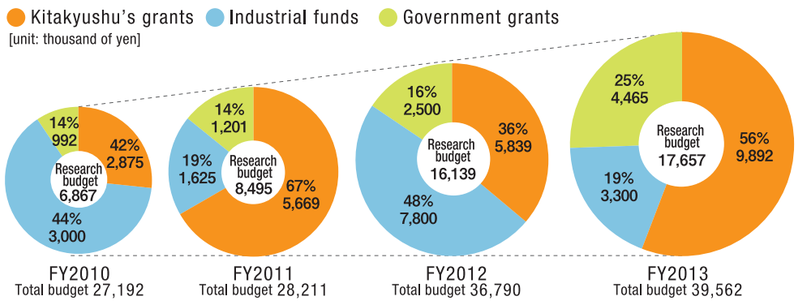
- **Tamotsu Ninomiya** (ICSEAD)
  2001 IEEE Fellow
  2006 IEEJ Industry Applications Society,Technical Achievement Award and more
- **Ichiro Omura** (KYUTECH)
  2005 The International Power Electronics Conference, Second Prize Paper Award
  2008 IEEE Power Electronics Society Conference, Best Paper Award

◆Member

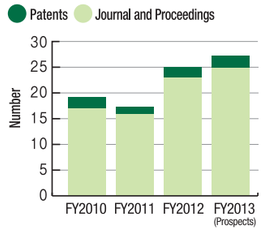
- **Seiya Abe** (ICSEAD)
  2003 IEEE PELS Japan Chapter Young Engineer's Best Paper of the Year Award
  2011 IEICE Technical Committee on Energy Engineering in Electronics and communications, young engineer's Presentation Award
- **Masanori Tsukuda** (ICSEAD)
  2005 The International Power Electronics Conference Second Prize Paper Award
- **Shin-ichi Nishizawa** (AIST)
  1992 IAF, Luigi G. Napolitano Award
  2012 The Japanese Association for Crystal Growth, Paper Award of the year
- **Satoshi Matsumoto** (KYUTECH)
  2011 IEEE 37th Photovoltaic Specialist Conference, Best Poster Award
- **Akiyoshi Baba** (KYUTECH)
- **Satoko Shinkai** (KYUTECH)

Results of Activities (As of December 2013)

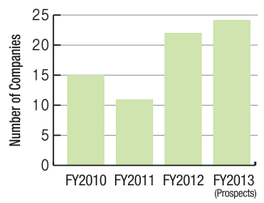
Activity funds



Publications



Visitors



Industrial funds Contents

FY2010	• ICT company:1
FY2011	• ICT company:1
FY2012	• ICT company:1 • Electrical company:1, • Auto motive company:1
FY2013	• Electrical company:1 • Auto motive company:1

Accsess

Business Venture Support Center (Collaboraion Center Bldg.4)

Contact us

The International Centre for the Study of East Asian Development, Kitakyushu
Electronics Research Group for Sustainability

Room 409 Business Venture Support Center 1-8 Hibikino, Wakamatsu-ku,
Kitakyushu, Fukuoka, 808-0135 JAPAN

TEL:81-93-695-3043 FAX:81-93-695-3044
URL:http://www.icsead.or.jp

Green Electronics Research Activities in Kitakyushu City

iCSEAD

The International Centre for the Study of East Asian Development, Kitakyushu

Electronics Research Group for Sustainability

1 Kitakyushu's Green city policies

ICSEAD

Master Plan "Energetic Kitakyushu"

[Leadership in Green Manufacturing]

[Leadership in Green Electronics R&D]

・Realization of a low-carbon society

[Leadership in Low-Carbon Emission City]

・Leadership in green manufacturing
・Leadership in green technology research

Green Growth Model City (OECD selected)

Future City (Japanese Gov. selected)

Green Asia International Strategic Comprehensive Special Zone (Japanese Gov. selected)

・Strengthening and creation of high-added value industries
・Attracting new companies and researchers
・Expansion of the global presence in green technology

Kitakyushu New Growth Strategy

[Asia's Leading City in High-Tech Industries for People's Comfort and Affluence]

[City of Green Industry]

Green Electronics Research Activities

・New generation power electronics research
・Reliability research for advanced power semiconductors and applications
・Education and training for next generation researchers and engineers
・Promotion of research partnership

2 Program for green electronics research

ICSEAD

We are planning to found the green electronics research center.

City with green inter-university center in KSRP | City of advanced green industry | City of green electronics research leadership

World leading research activity in green electronics (smart car, smart grid, green ICT, etc.) in collaboration with AIST, and KYUTECH in KSRP

Research topics Contribution for development of eco-industries, and research capability of the proposal for industrial funds and JST/NEDO government grants standing on the research achievement.

- Future power electronics systems
- Advanced power semiconductor devices
- Electronics equipped motor
- New reliability science for power electronics, etc.

Formation Research center with world leading researchers, post doctorial researchers and graduate students.

Education Project base learning.

Outlook Expansion and strengthen of research partnership in the field of green electronics through nation level research consortium activity

Contribution of the green growth city initiative

❶Green electronics inter-university function in KSRP

Attract researchers, engineers and industry partners with green electronics research activity and techno-produce function in KSRP

❷Research, education and training partnership with local enterprises

Support local enterprises in research and education/training for strengthen their key technologies and starting-up new technology development.

❸Expansion of external funds based on research activity

Increase the research activity supported by competitive research funds and feedback the result to local enterprises

Intellectual property creation by advanced researches | Project base learning for young engineers | Competitive research fund by excellent research activities

Eco-electronics research center

New power electronics research

AIST (National Institute of Advanced Industrial Science and Technology) — Coordination・Cooperation — KYUTECH (Kyushu Institute of Technology)

City of Kitakyushu / ICSEAD (The International Centre for the Study of East Asian Development,kitakyushu)

Joint research Research committee Company

Research cooperation Human resource development University・Research institute

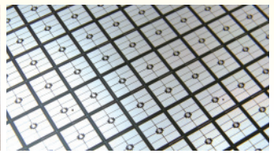
KSRP:Kitakyushu Science and Research Park (Hibikino, Wakamatsu-ku, Kitakyushu City)

3 New power electronics research

ICSEAD

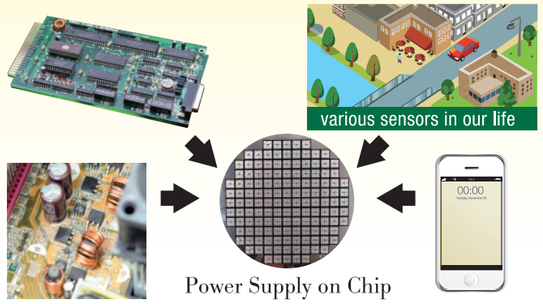
Research of Advanced Power Semiconductor Devices to Support Intelligent Electrification Society



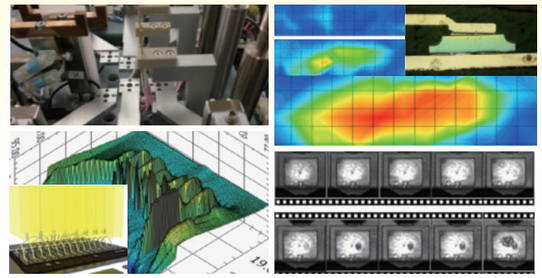
The ultimate performance of power devices as key components for eco-electronics is pursued to support intelligent electrification society in the future. Applications of the advanced power devices based on novel design theory will make possible remarkably highly efficient use of power electronics equipment such as high speed rail load traffic, EV, heat pumping and so on.

Future Miniaturized Integrated Power Supply System ----Power Supply on Chip ----



Our goal is to realize power supply on chip, which implement with LSI and power supply on the same chip through LSI and MEMS process, for contributing energy efficient society. Our R&D fields are design, process, device, circuit, and control technology for related area.

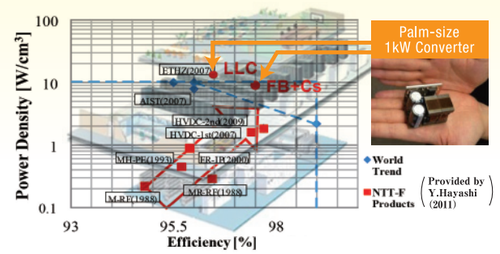
Reliability Research Corresponding to Next-Generation Power Electronics



We are working on creation of new reliability science for coming highly electrified society where inverter systems are ubiquitously used in large quantities. Remarkable reliability improvement achievement is intended by introducing research activities by real monitoring system using partial magnetic flux, ultrasonic wave and infrared ray in micro-scale and micro-second dimension.

Design Platform Technlogy

Research Model : High Power-Density Development for Power Distribution System at Data Center



According to future outlook, the traffic volume related to information processing at data centers will be 200 times larger and the power consumption will be 5 times larger in 2025. In order to suppress the power consumption and space factor at data centers, the power distribution systems with high efficiency and high power density are strongly demanded. At this research laboratory, a high-quality power converter with efficiency of 96% and power density of 12W/cm^3 has been developed.

4 Roadmap of eco-electronics research

ICSEAD

Integration

Demonstration Research in Environmental Model City
Demonstration research of green grid network in Kitakyushu

Green Grid Network
System and network research for the realization of "Future City"

Green Electronics
Realization of new power electronics with the advanced power devices research and so on.

2010 — 2015 — 2020 — 2025 — 2030

Realization of "Future City" and "New Growth Strategy" by Green Electronics Research