

# TAKAMIYA LAB.

Small chip that intelligently manages large power



Department of Informatics and Electronics  
Centre for Interdisciplinary Research on Micro-Nano Methods (CIRMM)

Department of Electrical Engineering and Information Systems, Graduate School of Engineering

<http://icdesign.iis.u-tokyo.ac.jp/en/>

To achieve a carbon-free world by 2050, we are conducting research on **integrated power management**, in which a small IC chip can intelligently handle large amounts of power, with the goal of making power electronics systems more energy-efficient.

**World's first IC chip that controls power semiconductors for energy saving**  
—Automatic waveform changing gate driver IC chip reduces energy loss by 49%. —

<b>Si IGBT</b> (6500 V, 1000 A)	<b>SiC MOSFET</b> (1200 V, 400 A)	<b>Si IGBT</b> (600 V, 100 A)	<b>SiC MOSFET</b> (650 V, 70 A)	<b>GaN FET</b> (100 V, 16 A)

**Hybrid DC-DC converters for automotive applications**  
(Mixed inductors and capacitors reduce losses.)

2-phase series capacitor synchronous rectifier