

TAKAMIYA LAB.

Small chip that intelligently manages large power



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

Integrated Power Management

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<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%.—

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

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

2-phase series capacitor synchronous rectifier