

Mitsubishi Electric's Railcar Traction Inverter with All-SiC Power Modules Achieves 40% Power Savings

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Odakyu Railways' 1000 series commuter train realizes dramatic cut in energy consumption

Mitsubishi Electric Corporation (TOKYO: 6503) announced today its main circuits featuring traction inverter made with all-silicon carbide (SiC), which were installed in a 1000 series urban train operated by Odakyu Electric Railway Co., Ltd. in Japan, have been verified to achieve an approximate 40-percent savings in power consumption compared to a train using conventional circuitry. The traction inverter, which is rated for 1,500V DC catenaries, was tested over a four-month period.

The verification compared a car retrofitted with an all-SiC traction inverter and another car fitted with a conventional gate turn-off thyristor traction inverter, both of which were put into actual commercial service. The test measured power consumption and electric power regeneration ratio of the two cars' main circuits, which comprise traction inverters, high-efficiency main motors and filter reactors.

The following results are average values measured between January 17 and May 8, 2015:

- 17% power savings during powered operation
- Increase from 34.1% to 52.1% in power regeneration ratio, calculated as power from regenerative brakes to catenaries divided by total electric power to drive the rail car
- 40% power savings overall

Specifications of Main Circuit

Input voltage: 1,500V DC

Main circuit system: Large-capacity all-SiC power modules Two-level PWM inverter with regenerative brakes

Control system: Four traction motors with 190kW, parallel control

Cooling system: Self cooling



Retrofitted Odakyu 1000 series train



Railcar traction inverter with all-SiC power modules

About Mitsubishi Electric Corporation

With over 90 years of experience in providing reliable, high-quality products, Mitsubishi Electric

Corporation (TOKYO: 6503) is a recognized world leader in the manufacture, marketing and sales of electrical and electronic equipment used in information processing and communications, space development and satellite communications, consumer electronics, industrial technology, energy, transportation and building equipment. Embracing the spirit of its corporate statement, Changes for the Better, and its environmental statement, Eco Changes, Mitsubishi Electric endeavors to be a global, leading green company, enriching society with technology. The company recorded consolidated group sales of 4,323.0 billion yen (US\$ 36.0 billion*) in the fiscal year ended March 31, 2015. For more information visit: <http://www.MitsubishiElectric.com> *At an exchange rate of 120 yen to the US dollar, the rate given by the Tokyo Foreign Exchange Market on March 31, 2015