MITSUBISHI ELECTRIC
Changes for the Better

MITSUBISHI ELECTRIC CORPORATION
PUBLIC RELATIONS DIVISION
7-3, Marunouchi 2-chome, Chiyoda-ku, Tokyo, 100-8310 Japan

FOR IMMEDIATE RELEASE **No. 3593**

Customer Inquiries

Semiconductor & Device Marketing Dept.A and Dept.B
Mitsubishi Electric Corporation

www.MitsubishiElectric.com/semiconductors/

Media Inquiries

Public Relations Division
Mitsubishi Electric Corporation

prd.gnews@nk.MitsubishiElectric.co.jp
www.MitsubishiElectric.com/news/

Mitsubishi Electric to Ship Samples of HV100 Dual-type X-Series HVIGBT Module

For extra powerful and efficient inverter systems used in railways, electric power systems and more

X-Series HVIGBT module HV100 dual-type

TOKYO, April 25, 2023 – Mitsubishi Electric Corporation (TOKYO: 6503) announced today that it will begin shipping samples of a new HV100 dual-type X-Series high-voltage insulated gate bipolar transistor (HVIGBT) module on May31, offering superior power, efficiency and reliability in inverter systems for large industrial equipment such as railways and electric power systems. The dual-type module, which achieves 4.5kV withstand voltage and 10.2kVrms dielectric strength, is rated at 450A, which is believed to be unmatched among 4.5kV silicon HVIGBT modules.[1] The product will be exhibited at major trade shows, including Power Conversion Intelligent Motion (PCIM) Europe 2023 in Nuremberg, Germany from May 9 to 11.

Power semiconductors are increasingly being utilized to efficiently convert electric power in order to lower the carbon footprint of global society, particularly in heavy industry, where these devices are used in power-conversion equipment such as inverters in railway traction systems and for DC power transmission. In response to the growing demand for devices offering high output, high efficiency and wide ranging output capacity, Mitsubishi Electric released two versions (3.3kV/450A and 3.3kV/600A) of its HV100 dual-type X-Series high-dielectric-strength HVIGBT module in 2021. In the near future, the forthcoming HV100 dual-type X-Series module will contribute to even higher output, higher efficiency and improved system reliability for inverters used in large industrial equipment requiring high dielectric strength.

[1] Compared to Si IGBT modules with dual-type HV100 packages achieving 4.5kV withstand voltage and 10.2kVrms insulation voltage, according to Mitsubishi Electric's own research as of April 25, 2023

Product Features

1) Industry-leading current rating for higher output and more efficiency in inverters

- The module's current rating of 450A, unsurpassed among 4.5kV dual-type modules, will help to increase the output and efficiency of inverter systems.
- The seventh-generation IGBTs adopt the CSTBT™ [2] structure and the diodes adopt Relaxed Field of Cathode (RFC) technology,[3] both proprietary technologies that have been optimized to balance high withstand voltage operation and low power loss.
- Optimized wiring between the main P-N terminals reduces internal inductance for faster switching and lower power loss.

2) Optimized terminal layout suited to various inverter configurations and capacities

- Optimized terminal layout enables parallel connection and supports various inverter configurations and capacities depending on the number of parallel connections.
- The package structure, which arranges DC and AC main terminals in opposite poles, helps to simplify circuit design.

3) Reduced thermal resistance contributes to inverter system reliability

- Integration of the insulating plate and base plate reduces thermal resistance between the junction and the case to help extend the thermal cycle life.[4]
- The base plate's uniform flatness and the power semiconductor chip's heat dissipation reduce the contact thermal resistance between the case and the heat sink to further extend the thermal cycle life.[5]

Main Specifications

Type	Voltage rating	Current rating	Isolation voltage	Connection	Dimensions (W×D×H)
CM450DE-90X	4.5kV	450A	10.2kVrms	2in1	100×140×40mm

Lineup of Dual-type HV100 Packages (new product in bold)

Type	CM450DE-66X	CM600DE-66X	**CM450DE-90X**
Ratings	3.3kV/450A	3.3kV/600A	**4.5kV/450A**
Isolation voltage	10.2kVrms	10.2kVrms	**10.2kVrms**
Sample shipments	Now on sale		**May 31, 2023**

Registered Trademark

CSTBT is a trademark of Mitsubishi Electric Corporation.

Website

Semiconductors & Devices Website
https://www.MitsubishiElectric.com/semiconductors/

---

2 Mitsubishi Electric's proprietary IGBTs using the carrier accumulation effect
3 Mitsubishi Electric's proprietary diode with optimized electron mobility on the cathode side
4 Case lifetime when temperatures changes have relatively long cycles
5 Case lifetime when temperatures changes have relatively short cycles

###

About Mitsubishi Electric Corporation

With more than 100 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. Mitsubishi Electric enriches society with technology in the spirit of its "Changes for the Better." The company recorded a revenue of 4,476.7 billion yen (U.S.$ 36.7 billion*) in the fiscal year ended March 31, 2022. For more information, please visit www.MitsubishiElectric.com

*U.S. dollar amounts are translated from yen at the rate of ¥122=U.S.$1, the approximate rate on the Tokyo Foreign Exchange Market on March 31, 2022