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## **MITSUBISHI ELECTRIC ANNOUNCES SALE OF NEW “NX SERIES” IGBT MODULE**

**Tokyo, June 16, 2009** – Mitsubishi Electric Corporation (President and CEO: Setsuhiro Shimomura) (TOKYO: 6503) announced today the launch of a new insulated gate bipolar transistor (IGBT) module in the “NX series,” mainly for use in inverters for industrial machinery. The new model, the CM150TX-24S, incorporates the company’s newly developed technology, which achieves the world’s lowest <sup>1</sup> switching power loss in IGBT modules as of June 16, 2009. Shipments begin on July 1, 2009.

\*1 Simulation in 30kW inverter operation (fc=10kHz)

The CM150TX-24S is a 6-in-1 IGBT module that operates at 150 amperes and up to 1200 volts. Mitsubishi Electric will further enhance its lineup of IGBT modules using this cutting-edge technology, and develop products with various amperage ratings and element composition.

### **Summary of Sale**

Model	Specifications	Price of sample (Including tax)	Shipment date
NX series, CM150TX-24S	1,200V/150A, 6 chips	US\$250	July 1, 2009

### **Aim of Sale**

Recently, industrial machinery employs inverters for drive and control, realizing higher energy efficiency. Inverters control the switching of frequency wavelengths according to electricity load. Given their high efficiency, there is growing demand for IGBT modules that incorporate IGBT chips and diodes used for driving these inverters.

IGBT modules play an important part in reducing switching loss in inverters, and Mitsubishi Electric has been involved in product improvements to reduce these losses, already succeeding in the development of IGBT modules with industry top-class specifications. For example, the company developed the carrier stored trench gate bipolar transistor (CSTBT™), an original structure that has a carrier accumulation layer in the trench structure with a deep chase in its wafer.

### **Product Features**

#### ***1) The world’s lowest switching power loss with the newly developed IGBT chip and diode***

The new IGBT module has an IGBT chip with an improved cell structure in the CSTBT™, as well as reduced ON resistance that also maintains the operation range. The new product also contains a diode with a reduced saturation voltage. As a result, the NX series IGBT module reduces power loss in inverter operation by approximately 20 percent compared to the CM150DX-24A (1,200V/150A, 2-in-1), one of Mitsubishi Electric’s previous models. For example, in a 30kW inverter with an IGBT module that operates at 150 amperes and up to 1200 volts, its power loss can be reduced from 200 watts to 160 watts.

2) **Compatible size and customizable parts make inverter design easy**

The CM150TX-24S is compatible with Mitsubishi Electric's previous models in the NX series, making inverter design easy. Not only does the new model share the same bottom size as other models in the NX series, but it also has common configuration of pin terminals, screw terminals (electrodes), metal bushes and other parts. This enables inverter manufacturers to customize the layout and combination of these parts in IGBT modules, and also choose from connection methods, such as screws and soldering.

**IGBT Development (Electric power loss in inverters)**

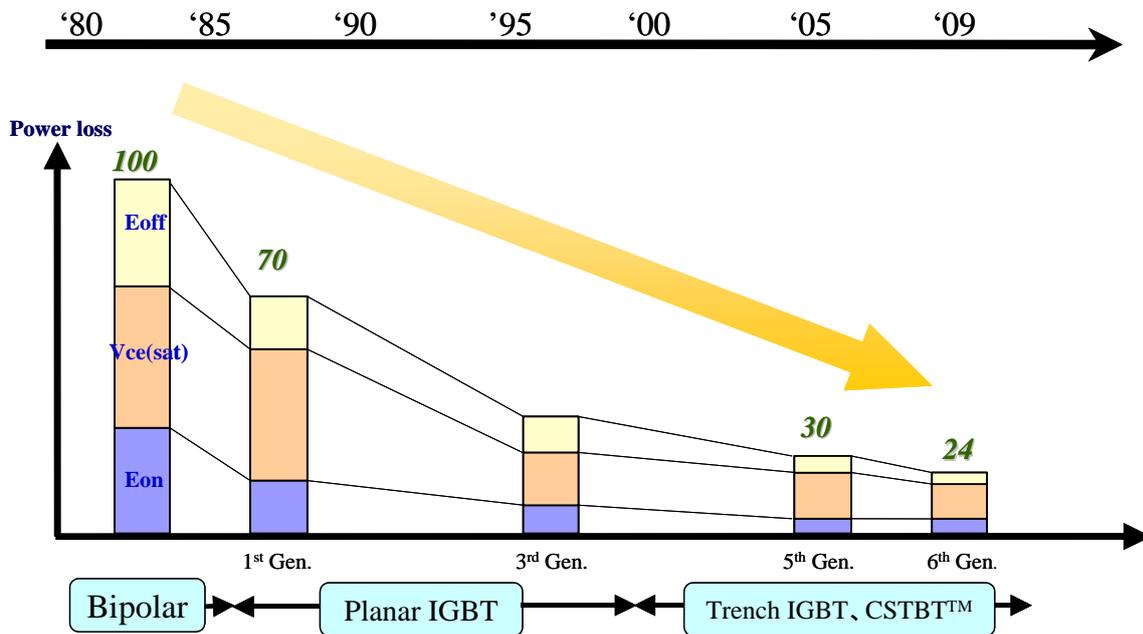


Fig.1

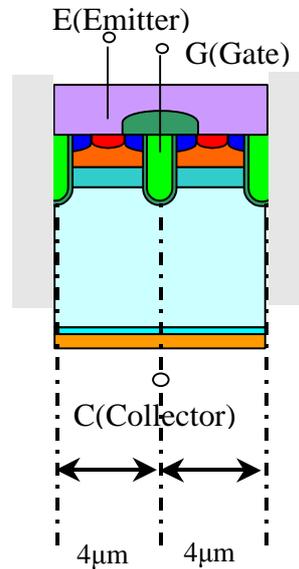
**Structure Comparison of New and Previous IGBTs**

The newly developed IGBT, a 6th generation IGBT, incorporates wafer detail processing technology with improvements to prevent short circuits, as well as technology that reduces saturation voltage and increases electric current.

The fluency of electric current in IGBTs is decided by the number of transistor cells in each chip. Therefore, it becomes important to make the trench interval of IGBTs small and build in many transistor cells.

The 6th generation IGBT has a trench interval of 2.4-micrometer pitch, narrowed from the 4-micrometer pitch in previous models, which reduces ON resistance -- a figure that indicates the amount of power loss -- by approximately 20 percent. By narrowing the trench interval, however, there is a tradeoff that makes the safe operation range smaller in IGBTs. Mitsubishi Electric has successfully addressed this issue in its 6th generation IGBT with wafer detail processing technology that optimizes the concentration profile.

## 5<sup>th</sup> Generation IGBT



## 6<sup>th</sup> Generation IGBT

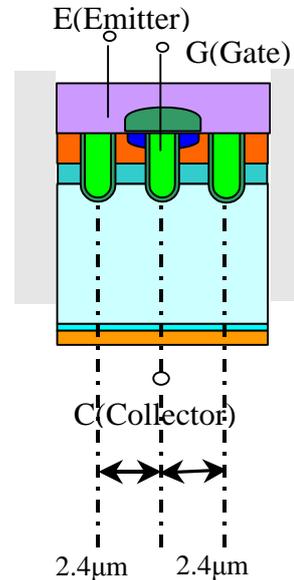


Fig.2

### Main Specifications

- Model: CM150TX-24S
- Collector-emitter Voltage: 1,200V
- Collector current: 150A
- Collector-emitter saturation voltage: 1.95V (@125 degrees C)
- Isolation voltage : 2,500V(@f=60Hz, AC 1 minute)
- Attachment side size: 62 x 122 mm

### Trademark

CSTBT (carrier stored trench gate bipolar transistor) is a trademark of Mitsubishi Electric.

### About Mitsubishi Electric

With over 80 years of experience in providing reliable, high-quality products to both corporate clients and general consumers all over the world, 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. The company recorded consolidated group sales of 3,665.1 billion yen (US\$ 37.4 billion\*) in the fiscal year ended March 31, 2009. For more information visit <http://global.mitsubishielectric.com>

\*At an exchange rate of 98 yen to the US dollar, the rate given by the Tokyo Foreign Exchange Market on March 31, 2009.

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