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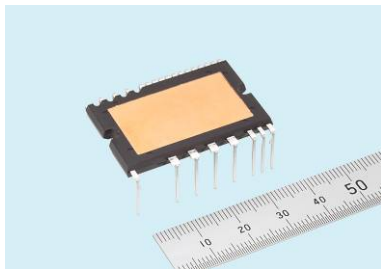
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Mitsubishi Electric to Begin Shipment of Silicon Carbide Power Module Samples

Modules contribute to downsized and more efficient electronic equipment for industries, homes

Tokyo, July 9, 2012 – Mitsubishi Electric Corporation (TOKYO: 6503) announced today that it will begin shipping samples of five kinds of power modules for home appliances and industrial equipment starting on July 31, 2012. The modules use silicon carbide (SiC), a next generation semiconductor material expected to significantly reduce power loss in diode and metal oxide semiconductor field effect transistor (MOSFET) chips.

The modules will be showcased at POWER SYSTEM JAPAN 2012 in TECHNO-FRONTIER 2012, an exhibition on electro-mechanical parts and devices to be held on July 11-13 at Tokyo Big Sight in Japan.



SiC module for home appliances



Industrial hybrid SiC-IPM



Industrial full SiC module

Inverters are widely used in home appliances like air conditioners and refrigerators, as well as in industrial devices, to increase energy efficiency. While Mitsubishi Electric already offers a wide variety of low-loss power semiconductor modules for inverters, the SiC modules offer significant reductions in power loss and improvements in high speed switching, achieving even higher efficiency and downsizing.

Of the five new types of SiC power module samples, three types are for home appliances, while two are for industrial devices such as inverters and servos.

Summary of Sale

Applications	Product name	Specifications	Begging of sample shipment
Home appliances	Hybrid SiC DIIPM ^{*1}	600V/15A 6in1	July 31, 2012
	Hybrid SiC DIPPF ^{*2}	600V/20Arms Interleave	August 2012
	Full SiC DIPPF	600V/20Arms Interleave	August 2012
Industrial devices	Hybrid SiC-IPM	1200V/75A 6in1	October 2012
	Full SiC Module	1200V /800A 2in1	January 2013

*1. DIIPM: Dual-in-line package intelligent power module

*2. DIPPF: Dual-in-line package power factor correction

Product Features

1. SiC power module for home electronics

1-1. Hybrid SiC DIIPM

- A SiC Schottky Barrier Diode (SBD) is used for the diode.
- Power loss is reduced by about 12% compared to DIIPM using silicon (Si).
- The shape, size and pin configuration are the same as those of the Super mini DIIPM.
- Offers the same protection as the Super mini DIIPM using Si.

1-2. Hybrid SiC DIPPF

- A SiC-SBD is used for the diode and achieves a maximum of 30kHz high-frequency switching.
- High-frequency switching contributes to the downsizing of peripheral components such as reactors and heat-sinks.
- The installation of a power factor correction (PFC) and driving IC contributes to downsizing through reduction of the mounting surface area and simplified wire patterning.
- Offers package compatibility with the Super mini DIIPM using Si.

1-3. Full SiC DIPPF

- SiC-MOSFET is used for the transistor, while SiC-SBD is used for the diode.
- Power loss is reduced by about 45% compared to products using Si.
- The adoption of SiC achieves a maximum of 50kHz high-frequency switching.
- High-frequency switching contributes to the downsizing of peripheral components such as reactors and heat-sinks.
- The installation of a PFC and driving IC contributes to downsizing through the reduction of mounting surface area and simplified wire patterning.
- Offers package compatibility with the Super mini DIIPM using Si.

2. SiC power module for general industry

2-1. Hybrid SiC-IPM

- SiC-SBD is used for the diode.
- Power loss is reduced by about 25% compared to its predecessor PM75CL1A120 of the IPM L1 series, and contributes to the downsizing and improved product efficiency.
- The shape, size and pin configuration are the same as those of its predecessor PM75CL1A120 of the IPM L1 series.
- Offers the same protection as its predecessor PM75CL1A120 of the IPM L1 series.

2-2. Full SiC-Module

- SiC-MOSFET is used for the transistor and SiC-SBD is used for the diode.
- Power loss is reduced by about 70% compared to its predecessor CM400DY-24NF of the IGBT module (used in a parallel configuration), and contributes to improved product efficiency.
- Significantly reduces the size of packages, while reducing the mounting area by about 60% compared to its predecessor CM400DY-24NF of the IGBT module (used in a parallel configuration), and contributes to downsizing and weight reduction.
- Adopts a low inductance package to fully utilize the superior performance of SiC.

Specifications

	Product name	Voltage rating	Current rating	Connection	Size (W)×(D)	Protections, other feature
Home appliances	Hybrid SiC DIIPM	600V	15A	6in1	24×38mm	<ul style="list-style-type: none"> • Built-in gate driver • Under-voltage protection • Short-circuit protection • Over-temperature protection ^{*3}
	Hybrid SiC DIPFPC	600V	20Arms	Interleave		
	Full SiC DIPFPC	600V	20Arms	Interleave		
Industrial devices	Hybrid SiC-IPM	1200V	75A	6in1	67×131mm	<ul style="list-style-type: none"> • Built-in gate driver • Under-voltage protection • Short-circuit protection • Over-temperature protection (Monitoring IGBT chip surface)
	Full SiC Module	1200V	800A	2in1	62×152mm	-

*3. Applies only to the hybrid SiC DIPFPC module

Environmental awareness

The SiC products are compliant with the European Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS).

Note: DIIPM and DIPPFC are registered trademarks of Mitsubishi Electric.

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About Mitsubishi Electric

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 3,639.4 billion yen (US\$ 44.4 billion*) in the fiscal year ended March 31, 2012. For more information visit <http://www.MitsubishiElectric.com>

*At an exchange rate of 82 yen to the US dollar, the rate given by the Tokyo Foreign Exchange Market on March 31, 2012