

Press Conference

Tuesday, 10th of May 2016PCIM Europe, Messezentrum 1, 90471 Nuremberg (Germany)
NCC Ost, Level 1, Room Hongkong

Press release

Mitsubishi Electric to Ship Samples of G1 Series IPMs Using 7th Generation IGBTs

Reduced power loss and improved reliability for industrial equipment

TOKYO, April 13, 2016 – Mitsubishi Electric Corporation (TOKYO: 6503) announced the start of sample shipments of its new G1 series intelligent power modules (IPM), high-function modules with a dedicated IC offering self-protection functions, featuring seventh-generation insulated-gate bipolar transistors (IGBTs) and comprising three different packages and 52 models in total, is scheduled for May 2016. Variable frequency inverters are being increasingly used in a wide range of motor control systems to deliver enhanced energy efficiency. In the output stage of these inverters, IPMs are commonly used for switching electric currents at high speeds. There is growing demand for IPMs offering low power loss, high output and small package sizes. The new modules deliver reduced power loss and improved reliability for general-purpose inverters, servo amplifiers, elevators, and other industrial equipment.

The modules are exhibited at major trade shows including MOTOR-TECH JAPAN 2016 during TECHNO-FRONTIER 2016 in Japan from April 20 to 22.

Product Features

A novel package technology downsizes industrial equipment and improves its reliability. The new compact packaging achieved by optimizing the main terminal shape reduces the package size by about 30 percent compared to the previous L1 series product, thereby contributing to the provision of compact, lightweight inverters. Integration of insulation and copper base in the substrate helps to increase the thermal cycle life, i.e. the life proven in stress tests of relatively long-term temperature cycling between two case temperatures. Finally this leads to more reliable equipment performance.



G1 A Package



G1 B Package



G1 C Package

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Thanks to upgraded seventh-generation CSTBT™ chips with incorporated carrier-store effect, power loss and EMI noise could be reduced. Relaxed Field of Cathode (RFC) diode chips incorporating a novel backside diffusion process, with the P layer being partially added on the cathode side and the hole injected during the recovery period to soften the recovery waveform, also contribute to the low power loss and the suppression of a recovery voltage surge.

Two new functions ease the design in the customers' development processes. The new error mode identification process, featuring Over Temperature Protection (OT), Supply Under Voltage-lock Protection (UV) and Short-Circuit Protection (SC), easily identifies the cause of errors. Thanks to the innovative two steps switching speed function, the trade-off between energy losses and noise could also be improved.

Other Features

The optional PC-TIM option is based on a Phase Change Thermal Interface Material, a high thermal conductivity grease, solid at room temperature and adapting with rising temperature. PC-TIM of optimized thickness is used, eliminating the need for thermal grease.

The A package serves for a flexible layout and shape of the main terminal. For the 6-in-1 circuit module, users can select between a straight or L-shaped main terminal layout and between a screw or solder pin version; for the 7-in-1 circuit, they can select between a screw or solder pin version of the straight main terminal layout. The package size is 50 mm × 90 mm.

The B and C package with sizes of 55 mm × 120 mm, respectively 85 mm × 120 mm, have a L-shaped screw version of the main terminal layout, respectively.

Environmental Awareness

The products mentioned in this release are compliant with the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) directive 2011/65/EU.

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About Mitsubishi Electric

With more than 90 years of experience in providing reliable, high-quality products to both corporate clients and general consumers all over the world, Mitsubishi Electric Corporation 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 as well as air conditioning and heating technology.

With around 129.000 employees the company recorded consolidated group sales of 36.0 billion US Dollar* in the fiscal year ended March 31, 2015. Our sales offices, research & development centres and manufacturing plants are located in over 30 countries.

Since 1978 Mitsubishi Electric is represented in Germany as a branch of Mitsubishi Electric Europe. Mitsubishi Electric Europe is a wholly owned subsidiary of Mitsubishi Electric Corporation in Tokyo.

* At an exchange rate of 120 yen to the US dollar, the rate given by the Tokyo Foreign Exchange Market on March 31, 2015

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