Product Information
“V1 Series” to Lineup of High Output Intelligent Power Modules

PM400DV1A060/PM600DV1A060
PM200DV1A120/PM300DV1A120
PM450DV1A120

Featuring low power loss and a compact package for motor control systems

Summary

Series	Model	Specifications	Shipment date
Large output power IPM V1 series	PM400DV1A060	600V/400A, 2 chips per pack	May 2010
	PM600DV1A060	600V/600A, 2 chips per pack	
	PM200DV1A120	1200V/200A, 2 chips per pack	
	PM300DV1A120	1200V/300A, 2 chips per pack	
	PM450DV1A120	1200V/450A, 2 chips per pack	

The V1 Series features low power loss and a compact package for inverters with volumes of 37 kilowatts (kW) or greater and servo systems with volumes of 15kW or greater.
An IPM is a type of power device with multiple chips combined into one package, including power chips using IGBTs and their driving circuits, as well as a variety of protection circuits. To use energy more efficiently, variable frequency inverters have recently become widely employed in motor control systems. In the output stage of these inverters, IPMs are commonly used for switching electric current at high speeds. There is growing demand for IPMs with lower power loss, higher output volume and smaller package size.
In 1998, Mitsubishi Electric launched the V Series, which has 2 IGBT chips embedded into one module. With the addition of the V1 Series, motor control system manufacturers will be able to choose from the two series to best suit their needs.

Features

Inverter power loss reduced by 20%

The IGBT chips incorporated in the V1 Series are carrier-stored trench gate bipolar transistor (CSTBT) TM*1 chips, which feature the latest power chip technology. By using these CSTBT chips, power loss in inverters can be reduced by approximately 20% compared to those using V Series chips.
*1 CSTBT is a trademark of Mitsubishi Electric.

Small package size helps miniaturize motor control systems

All five models in the V1 Series adopt the same package size of 120 × 70 millimeters, the same as those of small-sized models in the V Series. Compared to larger output-volume models in the V Series such as the 120 × 90 millimeter 1,200V/450A model, the package size of the V1 Series has been made smaller, helping reduce the size of motor control systems. The positions of the electrodes and connection holes in the V1 Series models are also the same as those in current models, which facilitates replacement.

Enhanced protection function

Compared to V Series, in which only the temperature of the case is monitored, V1 Series features enhanced heat protection with a temperature monitoring function in each chip.

Environmental consideration

V1 Series IPMs are compliant with the RoHS ("Restriction of the use of certain Hazardous Substances" in electrical and electronic equipment) Directive.

Overview

	V1 Series (New)	V Series (Previous)
Collector-emitter saturation voltage*2	1.85V	2.6V
Protection	Short circuit (SC) Under voltage (UV) Over temperature (OT) (detects IGBT chip temperature)	Short circuit (SC) Under voltage (UV) Over temperature (OT) (detects the case temperature)

*2: 125° C, 200A, typical value

Collector -emitter Voltage	Collector current	V1 Series (New)		V Series (Previous)	
		Model	Module size (W × D)	Model	Module size (W × D)
600V	400A	PM400DV1A060	120 × 70 mm	PM400DVA60	120 × 70 mm
	600A	PM600DV1A060		PM600DVA60	120 × 90 mm
1200V	200A	PM200DV1A120		PM200DVA120	120 × 70 mm
	300A	PM300DV1A120		PM300DVA120	120 × 90 mm
	450A	PM450DV1A120		—	

Application

Inverters
Servo systems

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