Mitsubishi Electric to Launch 1,200V High-voltage Integrated Circuit With Desaturation Detection for Power Semiconductors

2/4/2015

For AC400 V inverter systems

Mitsubishi Electric Corporation (TOKYO: 6503) announced today it has developed a high-voltage integrated circuit (HVIC) to drive power

semiconductors equipped with AC400 V inverter systems for use in Europe and elsewhere. The M81748FP boasts an industry-leading 1,200 V rating and desaturation detection. Sales begin on March 31.

M81748FP 1,200V HVIC with desaturation detection

Variable frequency inverters are being used increasingly in motor control systems of consumer appliances and industrial machinery to save energy and improve performance, so demand is growing for HVICs that drive power semiconductors in inverter systems. In particular, AC 400V inverter systems prevalent in Europe and certain other markets require high-voltage HVICs, so Mitsubishi Electric will now meet this demand with its new, high-reliability 1,200V HVIC, which boasts desaturation detection embedded with 1,200V P-channel MOSFET. Desaturation detection prevents thermal destruction of power semiconductors due to overcurrent. Fault protection using desaturation detection is more suitable for power modules from 150A than using a shunt resistor.

Product Features

1) Desaturation detection for reduced power loss reduction in power semiconductors

- P-side and N-side desaturation detection prevents overcurrent thermal destruction of power semiconductors using 1,200V P-channel MOSFET.
- HVIC directly detects shorts and earth faults in power semiconductors on P-side and transmits fault signals to N-side, shutting down systems.
- Contributes to power loss reduction in power semiconductors.

2) Highly durable 1,200V voltage for industrial-use AC 400V inverter systems

- HVIC uses a 1,200V divided reduced surface fields (RESURF) structure for an optimized surface. The structure prevents electric field concentration at the p-n junction, realizing low current leakage of a maximum 10μA.
- Polycrystalline silicon resistor field plate (PolyRFP) structure of chip surface greatly enhances durability.

3) High tolerance to switching noise helps achieve highly reliable inverter systems

- High latch-up immunity (parasitic Vertical -PNP transistor action) realized with chip's low-impedance buried layers.

Sale Schedule

Product	Model	Shipment
HVIC with desaturation detection	M81748FP	March 31, 2015

Main Specifications

Model number	M81748FP
Breakdown voltage	1,200V (high-side)／24V (low-side)
Output current	±2.0A
Low-side circuit current	1.2mA
High-side circuit current	0.7mA
Package type	24P2Q
Junction-ambient thermal resistance: Rth (j-a)	90 °C /W
Functions	5V logic input
	Short and earth protection (desaturation detection)
	Fault signal output (desaturation detection)
	Fault signal input and output shutdown (both P-side and N-side)
	Under voltage lockout
	Input interlock
	Fault automatic reset
	Active clamp output for gate shutdown (sink current: 2A)

Environmental Awareness

The M81748FP is compliant with the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) directive 2011/65/EU.

About Mitsubishi Electric Corporation

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 4,054.3 billion yen (US$ 39.3 billion*) in the fiscal year ended March 31, 2014. For more