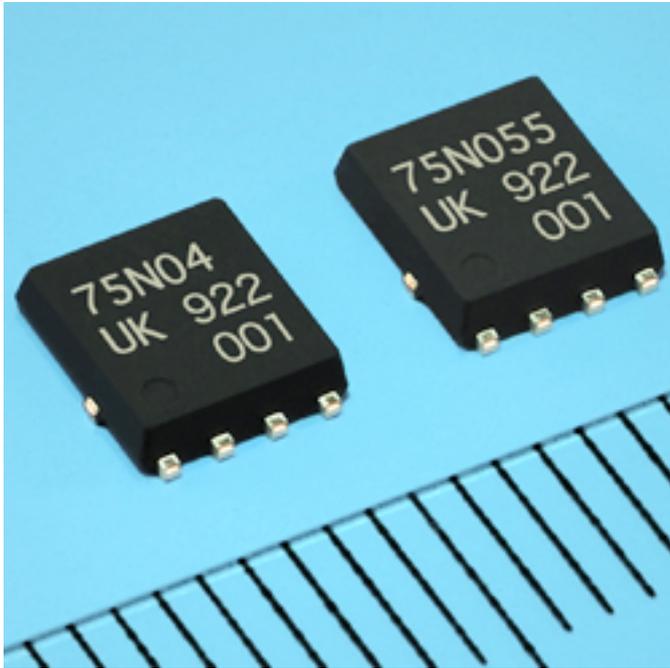


Power MOSFET Achieves 52 Percent Lower Loss



Renesas Electronics Corporation announced the availability of a new high-voltage N-channel power metal-oxide-semiconductor field-effect-transistor (MOSFET), the RJK60S5DPK, for power supply units that delivers high efficiency. The new power MOSFET provides low power consumption for PC servers, communication base stations and solar power generation systems.

The RJK60S5DPK power MOSFET is ideal for use in the primary power switching circuit of a power supply unit, which converts alternating current (AC) to direct current (DC). It is the first product in Renesas Electronics' high-voltage power MOSFET series that employs a high-precision super junction structure (Note 1) to achieve a figure of merit (FOM, Note 2), a key overall performance index for power MOSFET devices, which is approximately 90 percent improved from that of the company's existing products.

Recently, demand has grown for improved efficiency in power supply circuits to reduce energy consumption, and there is a particularly strong demand for low power consumption through improved power conversion efficiency in high-output switching power supplies for flat-panel TVs, communication base stations, PC servers, and solar power generation systems, and this has spurred demand for power MOSFETs with lower on-resistance (Note 3). However, there are limits to the improvements that can be achieved using a conventional planar structure. Renesas Electronics therefore made use of its accumulated expertise in power device technology to develop a high-precision super junction structure employing a deep-groove formation process, making it possible to produce MOSFETs with a lower on-resistance per unit of area.

Main features of the RJK60S5DPK power MOSFET

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(1) Industry-leading low on-resistance

The new RJK60S5DPK power MOSFET achieves an on-resistance of 150 milliohm ($m\Omega$, standard value at $I_D = 10\text{ A}$, $V_{GS} = 10\text{ V}$), approximately 52 percent lower than that of existing Renesas Electronics power MOSFETs. This reduces the amount of loss that occurs during the power conversion.

(2) High-speed switching

Renesas Electronics' new power MOSFET has a drive capacitance (Gate charge Q_{gd} , Note 4), of only 6 nC (nanocoulomb, standard value at $I_D = 10\text{ A}$, $V_{GS} = 10\text{ V}$), which affects the switching speed, approximately 80 percent less than that of existing Renesas Electronics products. This makes it possible to boost power-conversion efficiency through the use of high-speed switching.

The package for the new RJK60S5DPK power MOSFET is equivalent in size to the TO-3P standard package, and the pin assignments conform to the industry standard. This means it can easily be mounted on switching power supply circuit boards that have been evaluated using conventional planar MOSFET devices.

The products in the high-precision super junction structure power MOSFET series can deliver on-resistance per unit of area approximately 80 percent lower than that of products in the company's existing planar structure series, so if the on-resistance remains the same, the chip area can be decreased. Taking advantage of this, Renesas Electronics plans to release in the future a variety of power device products with smaller package sizes, such as products using the TO-220FL (10 millimeter (mm) \times 15 mm) package that provide the performance of existing products using the TO-3P (15.6 mm \times 19.9 mm) package.

In addition, Renesas Electronics has identified flat-panel TVs, communication base stations and PC servers as products that can benefit from switching power supplies with reduced energy consumption, and the company plans to market a series of new ultra-low on-resistance MOSFETs targeted at such applications. Renesas Electronics intends to expand the scale of its high-voltage power device business by utilizing its technology expertise of the new RJK60S5DPK power MOSFET and develop a range of new products tailored for specific applications.

More information can be found at

http://am.renesas.com/press/news/news20110112_s.html [1].

Pricing and Availability

Samples of Renesas Electronics' new RJK60S5DPK power MOSFET are available now priced at US\$5 each in sample quantities. Mass production is scheduled to begin starting April 2011 with a combined volume of 500,000 units per month projected by October 2011. (Pricing and availability are subject to change without notice.)

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[1] http://am.renesas.com/press/news/news20110112_s.html