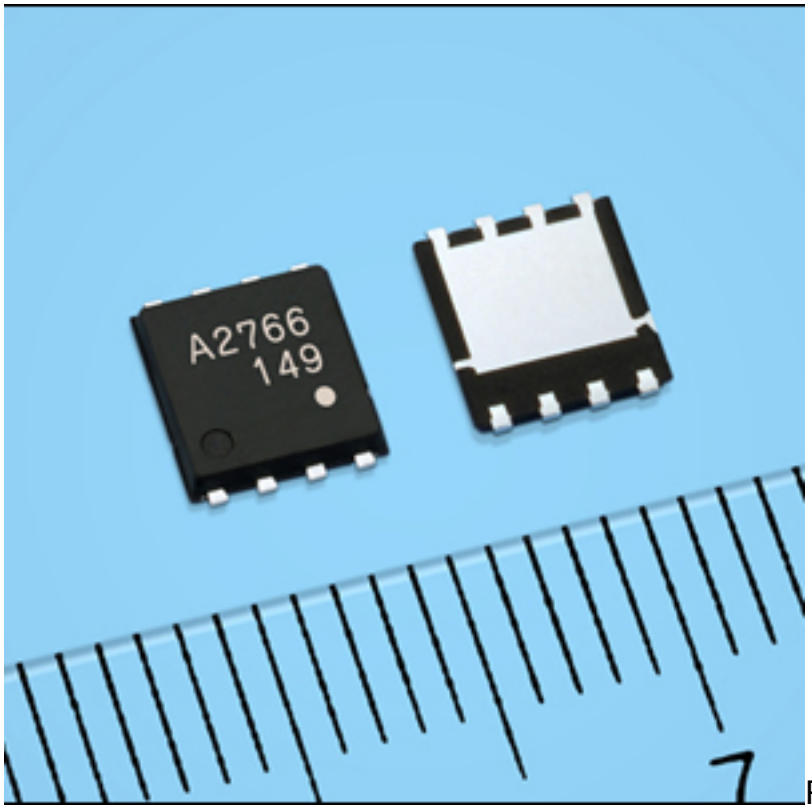
Power MOSFETs feature low on-state resistance



Renesas Electronics Corporation announced three new low on-state resistance [Note 1] MOSFET [Note 2] products, including the µPA2766T1A, optimized for use as ORing [Note 3] FETs in power supply units for network servers and storage systems.

Featuring the industry's lowest on-state resistance of 0.72 mΩ (typical value) for 30 V – about 50 percent lower resistance compared to Renesas' earlier products – and a high-efficiency, small surface mount package (8-pin HVSON), the new products enable high-current control in a smaller package contributing to power savings and miniaturization of the power units used for comparably large scale server storage systems.

For mission-critical systems, it is common to provide redundant power delivery, i.e., by ORing FET with multiple power units that maintain high reliability for the server storages systems. These ORing FETs are connected to the power output lines of each of the power supply units. They remain in the on-state duringnormal operation, but if one of the power supply units fails, the ORing FETs of that unit switch to the off-state in order to isolate them from the other power supply units and ensure that the failed unit does not disrupt system power.

During normal operation, the power output lines handle large currents of several tens to several hundreds of amperes. The ORing FETs must have low on-state resistance characteristics to prevent an increase in conduction loss or a drop in the power supply voltage.

In response to this need, Renesas has developed a trio of MOSFETs based on thecompany’s new low on-state resistance process. The new µPA2764T1A, µPA2765T1A and µPA2766T1A meet this need, offering industry-leading low on-resistance in power supply devices in smaller form factors.

Key features of the new low on-state resistance power MOSFET products:

(1) Industry’s lowest on-state resistance

The new µPA2766T1A delivers the industry’s lowest on-state resistance of 0.72 mΩ (typical value) for 30 V applications in a small 5 mm x 6 mm package and is less than the on-state resistance of previous Renesas products by approximately half.This contributes to improved power efficiency for the system overall by reducing the conduction loss of the ORing FETs for power supply units used in network servers and storage systems, which are the key applications to contribute to the smart society. In addition, this makes it possible to suppress large voltage drops with large currents. It is possible to attain highly precise power supply voltage even with power supply units having wide current fluctuations.

(2) 8-pin HVSON package with small mounting area and support for large-current control

The 8-pin HVSON package provides low package resistance because a metal plate is used to connect the FET die within the package to the pins. This, combined with the low on-state resistance of the FET die, allows for large-current control as much as rated 130 A (ID (DC)) in spite of the compact 5 mm × 6 mm size of the package. It also helps to reduce equipment size by enabling the use of the minimum number of parallel connections when multiple ORing FETs are connected in parallel to each of the power supply units in order to supply a large current.

The three new MOSFETs, including the µPA2766T1A, have on-state resistance ratings ranging from 0.72 mΩ to 1.05 mΩ (standard value). This range allows better product selection to best meet the user’s requirements in terms of operating current or environmental conditions. It also allows customers to supply optimal products and contributes to improved power efficiency and reduced space requirements.

Renesas Electronics plans to further strengthen the product lineup moving forward, and continue working to reduce on-state resistance and create even smaller packages to meet evolving customer needs.

[Note 1] The on-state resistance is the resistance when the power MOSFET is operating. A lower value indicates lower loss (conduction loss).

[Note 2] MOSFET is an abbreviation of “metal-oxide-semiconductor field-effect transistor.” MOSFETs are classified as either P-channel or N-channel, according to their structure. The new products are N-channel MOSFETs.

[Note 3] ORing refers to a configuration, in which multiple power supplies are

provided for a load, and switching between power supply voltages is performed automatically or the load is shared among the power supplies. This is implemented by means of power MOSFETs and a control circuit.

Pricing and availability

Samples of the new low on-state resistance power MOSFET products are available now. Sample pricing will vary. The sample price for the µPA2764T1A will be US$1.20 per unit, µPA2765T1A will be US$1.00 and µPA2766T1A will be US$1.80. Mass production of the new products is scheduled to begin in February 2013 and is expected to reach a scale of 5,000,000 units per month for the three products combined by October 2013. (Pricing and availability are subject to change without notice.)

www.renesas.com [1]

Source URL (retrieved on *10/31/2014 - 9:07am*):
http://www.ecnmag.com/product-releases/2013/01/power-mosfets-feature-low-state-resistance

Links:
[1] http://www.renesas.com