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600-V SiC Schottky Targets Air Conditioners, Base Stations, And Solar Arrays

Incorporating technology developed jointly with Hitachi, Renesas Electronics' RJS6005TDPP is a 600-V rated SiC Schottky barrier diode (SBD) targeting power converter applications in high-output electronic systems such as air conditioners, communication base stations, and solar power arrays. With its fast reverse-recovery time (t_{rr}) of 15 ns (measured at an I_F of 15 A and a di/dt of 300 A/µs), the SiC-SBD enables approximately a 40 percent reduction in power consumption compared to Renesas Electronics' existing power devices employing conventional silicon. In addition, the reverse-recovery time does not degrade as temperature rises, enabling consistently low switching loss when operating in high-temperature environments.

In addition, the SiC-SBD has a forward voltage (V_F) of only 1.5 V, lower than that of existing silicon fast trigger diode products. The temperature dependency of this characteristic is small, ensuring that a stable forward voltage can be obtained even under high-temperature conditions. This means that more compact heatsinking measures can be used.

The RJS6005TDPP uses a package equivalent to the industry-standard fully-molded TO-220, with which it is also pin compatible (see the figure.) So, the SiC-SBD can easily be used as a replacement for conventional silicon diodes on existing printed wiring boards.

According to the vendor, the RJS6005TDPP also compares favorably with other SiC Schottky diodes currently on the market. Compared to other SiC-based diodes the RJS6005TDPP is said to have lower V_F, which means lower conduction loss in the application.

In terms of reverse-recovery time, the company claims their new SiC-SBD is on par with competing SiC devices. When compared with most similarly sized diodes, the RJS6005TDPP is said to exhibit a similar t_{rr} given similar typical operating conditions. Renesas also notes that one competitor has a diode with a somewhat faster t_{rr} but with a substantially worse V_F.

Samples of the RJS6005TDPP are available now, priced at $5 per unit. Mass production is scheduled to begin in March 2012 and is expected to reach a volume of 100,000 units per month by August 2012.

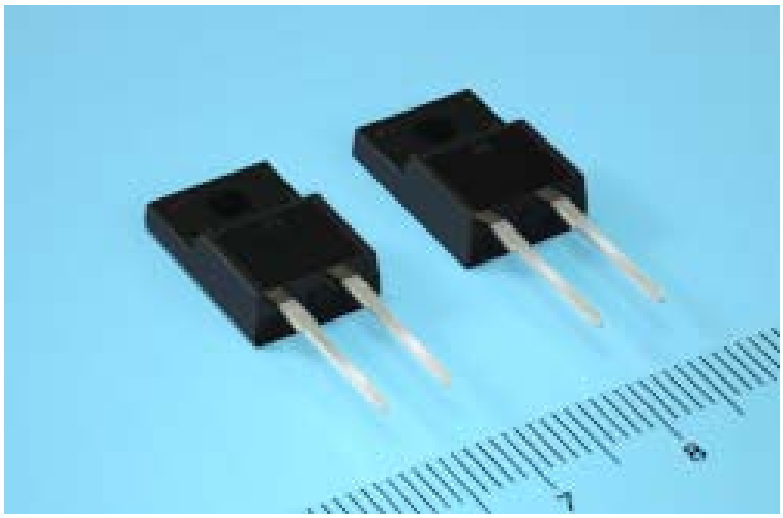

Figure. The RJS6005TDPP, a 600-V rated SiC Schottky barrier diode, comes in a package equivalent to the industry-standard fully-molded TO-220, making it a pin-compatible replacement for silicon diodes.