Cree?s 650V SiC Schottkys boost data-center power supply efficiency

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The diodes provide blocking voltage to 650V to accommodate recent changes in data-center power architecture that industry consultants estimate will result in energy-efficiency gains of up to 5%. Because data centers account for nearly 10% of the world's annual consumption of electrical power, any efficiency gain represents a significant opportunity to reduce overall power consumption, says Cree.

Conventional switch-mode power supplies typically have an input voltage range of 90–264V, supporting various AC input sources worldwide. In existing data-center power architectures, 3-phase/480V power is supplied from the local utility. This is converted to 3-phase/208V by a power transformer and then further conditioned to provide input power to the server power supply. This conversion step reduces overall efficiency due to transformer losses.

Recent trends in data-center power architecture call for the elimination of the 480V-to-208V conversion to boost overall data-center efficiency. Instead of providing 120V AC from the 3-phase/208V line to neutral, server power supplies will now be expected to accept a broader universal line voltage range of 90–305V (277V plus a 10% guard band) directly from the 3-phase/480V line to neutral. This architecture eliminates the need for the step-down power transformer, along with the related energy losses and expense.

Optimal operation of server power supplies with a higher input voltage range of 90–305V requires power components such as Schottky diodes that have an extended maximum blocking voltage of 650V. Cree says that its new 650V-rated devices provide a suitable solution for designers of state-of-the-art power supplies for data-center servers and communications equipment. The Z-Rec SiC diodes not only feature the 650V blocking voltage needed for these power supplies but they also further reduce energy losses (compared with silicon devices) by eliminating reverse recovery losses.

"SiC technology is critical to developing the next generation of advanced, energy-efficient data-center power system designs because it virtually eliminates diode switching losses," explains **Cengiz Balkas**, Cree VP & general manager, Power and RF. *"Conventional silicon devices' switching losses are known to be big contributors to energy inefficiency, so replacing them with SiC devices can boost the efficiency of the power factor correction stage of the power supply by up to 2%, resulting in even greater overall efficiency improvement than with architectural changes alone,"* he adds.

The initial products in the C3DXX065A Series 650V Z-Rec Schottky diode family

include 4, 6, 8 and 10A versions in TO-220-2 packages. All devices are rated for operation from –55°C to +175°C. The devices are fully qualified and released for production use.

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Cree launches Z-Rec 1700-V JBS diode series
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