First Commercial Silicon Carbide Power MOSFET Available - Destined to Replace Silicon Devices in High Voltage Power Electronics

DURHAM, N.C. -- (BUSINESS WIRE) -- In a move that heralds a performance revolution in energy efficient power electronics, Cree, Inc. has introduced the industry's first fully-qualified commercial silicon carbide power MOSFET. This establishes a new benchmark for energy efficient power switches and can enable design engineers to develop high voltage circuits with extremely fast switching speeds and ultralow switching losses.

The SiC MOSFET can be used today for solar inverters, high-voltage power supplies and power conditioning in many industrial power applications. Over the next several years, SiC power switches and diodes could also expand into motor drive control, electric vehicles and wind energy applications. The market for power semiconductors in these applications is estimated at approximately $4 billion today, reaching nearly $6 billion by 2015.

The addition of the SiC power MOSFET to Cree's world-class silicon carbide Schottky diode family enables power electronics design engineers to develop "all-SiC" implementations of critical high power switching circuits and systems with levels of energy efficiency, size and weight reduction that are not achievable with any commercially available silicon power devices of comparable ratings.

"This introduction of our SiC power MOSFET represents many years of materials research, process development and device design," said John Palmour, Cree co-founder and chief technology officer, Power and RF. "But the end result is that the industry's first 'ideal' high voltage switching device is no longer a future technology – it is commercially available and ready for design-in today."

"Together with our 600V, 650V, 1200V and 1700V SiC Schottky diodes, Cree Power has established a new class of SiC power components that are destined to lead the power semiconductor industry in the years to come, and eventually replace silicon devices in the majority of critical power electronics applications with breakdown voltage requirements of 1200V or higher."

"Cree's release of the SiC MOSFET represents a major step forward in power technology and enables a new standard in performance and reliability to be reached," said Per Ranstad, Product Manager at Alstom Power - Thermal Services in Sweden. "At Alstom, we have been working with Cree to demonstrate the capabilities of this new device, in particular seeing its impact on energy efficiency in power systems, and we are definitely excited by the results we have achieved to date."

Cree's SiC MOSFET, the CMF20120D, provides blocking voltages up to 1200V with

an on-state resistance (RDSon) of just 80m? at 25°C. Setting Cree's SiC MOSFET apart from comparable silicon devices, the RDSon remains below 100m? across its entire operating temperature range. This consistency of performance characteristics across operating conditions, along with a true MOSFET device architecture (normally-off), makes it ideal for power electronics switching circuits.

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