

Abstract Submitted
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High Voltage, Fast-Switching Module for Active Control of Magnetic Fields and Edge Plasma Currents TIMOTHY ZIEMBA, KENNETH MILLER, JAMES PRAGER, ILIA SLOBODOV, Eagle Harbor Technologies, Inc. — Fast, reliable, real-time control of plasma is critical to the success of magnetic fusion science. High voltage and current supplies are needed to mitigate instabilities in all experiments as well as disruption events in large scale tokamaks for steady-state operation. Silicon carbide (SiC) MOSFETs offer many advantages over IGBTs including lower drive energy requirements, lower conduction and switching losses, and higher switching frequency capabilities; however, these devices are limited to 1.2-1.7 kV devices. As fusion enters the long-pulse and burning plasma eras, efficiency of power switching will be important. Eagle Harbor Technologies (EHT), Inc. developing a high voltage SiC MOSFET module that operates at 10 kV. This switch module utilizes EHT gate drive technology, which has demonstrated the ability to increase SiC MOSFET switching efficiency. The module will allow more rapid development of high voltage switching power supplies at lower cost necessary for the next generation of fast plasma feedback and control. EHT is partnering with the High Beta Tokamak group at Columbia to develop detailed high voltage module specifications, to ensure that the final product meets the needs of the fusion science community.

Timothy Ziemba
Eagle Harbor Technologies, Inc.

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