

Abstract Submitted  
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**Silicon Carbide MOSFET-Based Switching Power Amplifier for Precision Magnet Control** KENNETH MILLER, TIMOTHY ZIEMBA, JAMES PRAGER, JULIAN PICARD, Eagle Harbor Technologies, Inc. — Eagle Harbor Technologies, Inc. (EHT) is using the latest in solid-state switching technologies to advance the state-of-the-art in magnet control for fusion science. Silicon carbide (SiC) MOSFETs offer advantages over IGBTs including lower drive energy requirements, lower conduction and switching losses, and higher switching frequency capabilities. When comparing SiC and traditional silicon-based MOSFETs, SiC MOSFETs provide higher current carrying capability allowing for smaller package weights and sizes and lower operating temperature. To validate the design, EHT has developed a low-power switching power amplifier (SPA), which has been used for precision control of magnetic fields, including rapidly changing the fields in coils. This design has been incorporated in to a high power SPA, which has been bench tested. This high power SPA will be tested at the Helicity Injected Torus (HIT) at the University of Washington. Following successful testing, EHT will produce enough SiC MOSFET-based SPAs to replace all of the units at HIT, which allows for higher frequency operation and an overall increase in pulsed current levels.

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