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# Characterization of high voltage 4H-SiC IGBTs with wide epitaxial drift regions.

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Silicon carbide (SiC) IGBTs fabricated on wide epitaxial drift regions are desirable for pulsed-power and continuous low-duty cycle power conversion systems due to the high avalanche breakdown voltages as well as the ability to switch high currents at fast repetition rates. For mobile platforms, the use of SiC-based electronics can be advantageous as it allows for: 1) a significant reduction of volume in comparison to silicon and 2) burst/continuous modes of operation and advanced triggering in comparison to gas switches. This work focuses on exploring the long term reliability and repetitive switching capabilities of recently fabricated 4H-SiC IGBTs with epitaxial drift regions greater than 160 μm and avalanche breakdown voltages greater than 17 kV. This paper expands on previous work reported on similar devices [1-2], with an emphasis on pushing for continuous and burst mode operation.

[1] E.V. Brunt, L. Cheng, M. J. O'Loughlin, J. Richmond, V. Pala, J. Palmour, C. Tipton, and C. Scozzie, "27 kV, 20 A 4H-SiC n-IGBTs,"Silicon Carbide and Related Materials. Materials Science Forum. 2014

[2] M. Hinojosa., A. Ogunniyi, S. Bayne, and C. Scozzie. "Evaluation of High Voltage, High Power 4H-SIC Insulated-Gate Bipolar Transistors,"IEEE International Power Modulator and High Voltage Conference. Santa Fe, NM. 2014.

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