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## High Energy Density Power Supply Development at NSWCCD

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Directed energy applications exist in which pulsed power systems are required to operate repetitively with average power in excess of 100 kW for a short duration followed by a relatively long period of inactivity. The small duty-factor of such systems allows for size, weight, and power optimization of power electronic systems. This paper presents the development of a high power density, low duty-factor series resonant CCPS operated from a 250 V super-capacitor prime power source. Analytical and numerical analysis of a low-leakage inductance, nanocrystalline cored high-voltage transformer will be presented. Also, FEM analysis of duty-factor limitations brought on by thermal stress will be discussed. Finally, experimental test results of the converter will be presented. This work is supported by the Air Force Research Laboratory (AFRL).

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