Title: Solid-State Bipolar Marx Converter with Output Transformer and Energy Recovery

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Abstract: The purpose of this paper is to present and discuss a general HV topology of the solid-state Marx modulator, for unipolar or bipolar generation connected with a step-up transformer to increase the output voltage applied to a resistive load. Due to the use of an output transformer, discussion about the reset of the transformer is made to guarantee zero average voltage applied to the primary. It is also discussed the transformer magnetizing energy recovering back to the energy storage capacitors. Simulation results for a circuit that generates 100 kV pulses using 1000 V semiconductors are presented and discussed regarding the voltage and current stress on the semiconductors and result obtained.

Author Keywords: Bipolar High-Voltage Pulses; Solid-State Switches; High-Voltage Transformer; Marx Converter Topology; Energy Recovery

KeyWords Plus: Topology

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