

Title: Solid-State Bipolar Marx Generator with Voltage Droop Compensation

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Abstract: This paper addresses the voltage droop compensation associated with long pulses generated by solid-state based high-voltage Marx topologies. In particular a novel design scheme for voltage droop compensation in solid-state based bipolar Marx generators, using low-cost circuitry design and control, is described. The compensation consists of adding one auxiliary PWM stage to the existing Marx stages, without changing the modularity and topology of the circuit, which controls the output voltage and a LC filter that smoothes the voltage droop in both the positive and negative output pulses. Simulation results are presented for 5 stages Marx circuit using 1 kV per stage, with 1 kHz repetition rate and 10% duty cycle.

Author Keywords: Bipolar High-Voltage Pulses; Solid-State Switches; Voltage Droop Compensation; Marx Converter Topology; PWM Control

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