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Title: A DC Voltage-Multiplier Circuit Working as a High-Voltage Pulse Generator

Source: IEEE TRANSACTIONS ON PLASMA SCIENCE, 38 (10): 2725-2729 Part 1 OCT 2010

Language: English

Document Type: Article

Author Keywords: High-voltage (HV) techniques; power semiconductor devices; pulsed-power systems; voltage multipliers (VMs)

KeyWords Plus: MARX-GENERATOR; MODULATOR

Abstract: The intensive use of semiconductor devices enabled the development of a repetitive high-voltage pulse-generator topology from the dc voltage-multiplier (VM) concept. The proposed circuit is based on an odd VM-type circuit, where a number of dc capacitors share a common connection with different voltage ratings in each one, and the output voltage comes from a single capacitor. Standard VM rectifier and coupling diodes are used for charging the energy-storing capacitors, from an ac power supply, and two additional on/off semiconductors in each stage, to switch from the typical charging VM mode to a pulse mode with the dc energy-storing capacitors connected in series with the load. Results from a 2-kV experimental prototype with three stages, delivering a 10-mu s pulse with a 5-kHz repetition rate into a resistive load, are discussed. Additionally, the proposed circuit is compared against the solid-state Marx generator topology for the same peak input and output voltages.

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Publisher: IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC

Publisher Address: 445 HOES LANE, PISCATAWAY, NJ 08855-4141 USA

ISSN: 0093-3813

DOI: 10.1109/TPS.2010.2050495

29-char Source Abbrev.: IEEE TRANS PLASMA SCI

ISI Document Delivery No.: 670LE