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**Book Group Author(s):** IEEE

**Title:** Repetitive Solid State Pulse Modulator Based on a DC Voltage Multiplier

**Source:** 2009 IEEE Pulsed Power Conference, VOLS 1 AND 2: 399-403 2009

**Language:** English

**Document Type:** Proceedings Paper

**Conference Title:** 17th IEEE International Pulsed Power Conference

**Conference Date:** JUN 28-JUL 02, 2009

**Conference Location:** Washington, DC

**Conference Sponsors:** IEEE.; POWEREX.; TECH X.; Gen Atom Elect Syst.; HVR.; Silicon Power.; Stangenes Ind.; Appl Energet.; ABB.; SBE.; ULTRAVOLT.; Barth Elect.; pulsetech.; TDK LAMBDA.; Kumamoto Univ.; Diversified Technologies.; CKE.; HVCA.

**KeyWords Plus:** Circuits

**Abstract:** A newly developed solid-state repetitive high-voltage (HV) pulse modulator topology created from the mature concept of the d.c. voltage multiplier (VM) is described. The proposed circuit is based in a voltage multiplier type circuit, where a number of d.c. capacitors share a common connection with different voltage rating in each one. Hence, besides the standard VM rectifier and coupling diodes, two solid-state on/off switches are used, in each stage, to switch from the typical charging VM mode to a pulse mode with the d.c. capacitors connected in series with the load. Due to the on/off semiconductor configuration, in half-bridge structures, the maximum voltage blocked by each one is the d.c. capacitor voltage in each stage. A 2 kV prototype is described and the results are compared with PSPICE simulations.

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**Publisher:** IEEE

**Publisher Address:** 345 E 47TH ST, NEW YORK, NY 10017 USA

**ISBN:** 978-1-4244-4064-1

**ISI Document Delivery No.:** BPZ37