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Development of low-impedance, variable pulse-width, high repetition-rate, 400 kV modulator

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A low impedance modulator made up of ceramic-loaded parallel-plate transmission line sections in a Marx configuration has been developed as a test bed for high power microwave sources. The generator has configurable impedance between 15 and 25 ohms, pulse-width between 50 and 200 ns, and can operate at repetition rates up to 100 Hz with a 200 kW high voltage power supply. The energy stored in the lowest impedance and longest pulse width setting is 2 kJ. A low inductance, 18 mm thick center-plane triggered rail switch has been developed around an SLA 3D printed pressure vessel. The generator design, implementation, and initial experimental results are discussed.

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