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SOLID-STATE PULSED POWER BASED ON SEMICONDUCTOR OPENING SWITCHES

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The presentation reviews the results of studies on the SOS effect –nanosecond interruption of superdense currents in semiconductor diodes –and its application in high-current electronics for powerful nanosecond pulse generation. The base physical processes that determine the mechanism of operation of opening switches, which are based on the SOS effect, are considered. Design and characteristics of the SOS diodes –high-power semiconductor opening switches –are given. Solid-state SOS based generators having an output peak voltage up to 1 MV, a peak power over 10 GW, and a pulse repetition frequency up to kHz-range are described. Applications of the SOS generators in various fields of pulsed power electronics are given. Future prospects on SOS based pulsed power systems are discussed.

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