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(54) **HIGH-POWER REPEAT-FREQUENCY SOLID-STATE SWITCH CONTROLLED BY COMBINATION OF OPTICAL AMPLIFICATION AND ELECTRICAL AMPLIFICATION, AND METHOD**

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(57) **ABSTRACT**

Disclosed are a high-power repeat-frequency solid-state switch controlled by a combination of an optical amplification and an electrical amplification, and a method. The switch includes an optical pulse unit, an optical amplification device, an optical coupling device and a photoelectric semiconductor structure; the photoelectric semiconductor structure takes a photoelectric effect material as a base, and a multi-layer doping structure is manufactured on the photoelectric effect material; the optical pulse unit is configured to output an optical pulse signal to the optical amplification device; the optical amplification device is configured to amplify the optical pulse signal; the optical coupling device is configured to shape and diffuse the amplified optical pulse signal to form an array optical pulse signal; and irradiated by the optical pulse signal, the photoelectric effect material generates photo-induced carriers subjected to a photo-induced linear model amplification and/or a field-induced nonlinear model amplification in the multi-layer doping structure.