Microhollow cathode discharge (MHCD) can provide high density of initial electrons under pulse voltage, which is used to ignite efficiently a gas switch discharge at an atmospheric pressure. The structure of microhollow cathode is two electrodes divided by about 200\(\mu\)m thick dielectric and threaded by about 100\(\mu\)m hollow. Array microhollow cathode discharge (MHCD) was operated at atmospheric with 2.5kV pulse voltage of 20ns rise time and current up to 100A, which is supplied by the charged capacitance of power supply. Triggered by such structure, a gas switch operated under voltage of 50kV with 30ns fall time and current of 1kA with 15ns rise time was fabricated with a 2nF capacitance and a 50\(\Omega\) resistance.

The switch characteristics such as the range of switch working voltage, on-resistance, delay time and jitter are given, and the influences of the rise time of trigger voltage and the value of trigger current on switch performance is mainly discussed. The advantages of the switch are obvious: lower trigger voltage with simply trigger circuit and multipoint discharge. An electrical model including stray capacitances is set up and the modeled results agree very well with the measured currents and voltages.