An investigation of the use of light to trigger semiconductor thyristors for capacitor discharge applications has been conducted. The investigation consisted of a technical literature and background search, design and analysis of optically silicon thyristors, and simulations of a capacitor discharge circuit containing the designed switches. By changing the design parameters it was possible to design one opto-thyristor with 522 V blocking voltage, 4.06 kA peak current and di/dt of 266.22 kA/μs and another one with 274.5 V blocking voltage, 3.94 kA peak current and di/dt of 664 kA/μs. Both of these devices were in a realistic capacitor discharge circuit.