OPTICALLY TRIGGERED THYRISTOR FOR CAPACITOR DISCHARGE APPLICATIONS

Manasa Kotha

Dr. Robert M. O'Connell, Thesis Supervisor

ABSTRACT

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.