

HIGH VOLTAGE DC BY MARX GENERATOR

PRINCIPLES

ABSTRACT

The project is designed to generate high voltage DC using Marx generator principle by using MOSFET and capacitor stacks. The Marx Principle was developed by Erwin Otto Marx. Its principle is to generate a high voltage pulse using a number of capacitors in parallel to charge up during the on time and then connected in series to develop higher voltage during the off period. This principle is used to generate voltages in the range of KV's in real-time for testing the insulation of the electronic appliances like transformers and the insulation of the power carrying lines.

This demo project consists of 4 stages and each stage is made of one MOSFET, two diodes, and one capacitor. MOSFET is used as a switch; diodes are used to charge the capacitor at each stage without power loss. A 555 timer generates pulses for the capacitors to charge in parallel during ON time. During OFF time of the pulses the capacitors are brought in series with the help of MOSFET switches. Finally, number of capacitors used in series (4 in our project) adds up the voltage to approximately 3 (4 capacitors-1 capacitor) times the supply voltage. This system structure gives compactness and easiness to implement the total system from a DC supply of 12V to get approximately (30V-36V)

This concept in future can be extended to Generate High voltages (KV) using more number of capacitors. This technique is adopted for insulation testing of the electronic components, wires, gadgets etc.

BLOCK DIAGRAM



