Derivation of load peak voltage, power consumption and potential energy management in a thyristor controlled Marx impulse generator for capacitor discharge application

Abstract

Calculation of the load peak voltage, potential energy and power consumption of a Marx impulse generator, as a function of time, are presented. The equations are generalized and can be used to the design of any type of n-stage Marx impulse generator. The results were validated for a thyristor controlled Marx impulse generator with a maximum number of stages of 10 and 3 kV input DC voltage, which used 1 MΩ resistors and 33 nF capacitors in its topology.