

Title: Modelling of n-Stage Blumlein Stacked Lines for Bipolar Pulse Generation

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Abstract: A Blumlein line is a particular Pulse Forming Line, PFL, configuration that allows the generation of high-voltage sub-microsecond square pulses, with the same voltage amplitude as the dc charging voltage, into a matching load. By stacking n Blumlein lines one can multiply in theory by n the input dc voltage charging amplitude. In order to understand the operating behavior of this electromagnetic system and to further optimize its operation it is fundamental to theoretically model it, that is to calculate the voltage amplitudes at each circuit point and the time instant that happens. In order to do this, one needs to define the reflection and transmission coefficients where impedance discontinuity occurs. The experimental results of a fast solid-state switch, which discharges a three stage Blumlein stack, will be compared with theoretical ones.

Author Keywords: Blumlein Line; Propagation Waves; Reflection Coefficient; Transmission Coefficient; Voltage Gain

KeyWords Plus: Design

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