

A geophysical pulse voltage generator for seismic and electric exploration of the subsurface

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Abstract. This article describes the process and results of the development and testing of a cost-effective, portable, safe to move by air geophysical pulse voltage generator for seismic exploration of the subsurface. The generator is based on high-speed power electronic keys of a new generation consisting of an insulated gate bipolar transistor or a field-effect transistor based on silicon carbide, a compact power converter of alternating voltage from an autonomous generator or electric network to direct voltage using pulse-width modulation and current or voltage stabilization depending on the mode set by a researcher. Field tests were conducted to confirm the suitability of the developed design of the generator and the correctness of the chosen parameters of its elements. To this end, a detailed analysis of the effect of the developed geophysical generator on the parameters of the geoenvironment was carried out.

Keywords:

seismic exploration, electric exploration, geophysical research, insulated gate bipolar transistor, silicon carbide field-effect transistor, power converter, rectifier, seismic noise, electromagnetic sounding

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