

工程与应用

基于煤矿井下UWB脉冲产生电路的设计与研究

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摘要 介绍了我国煤矿井下无线通信的现状, 提出将超宽带无线通信技术应用于井下。针对UWB脉冲的幅频特性, 详细分析了晶体管雪崩效应理论和工作原理, 利用此方法设计出多级并联同触发窄脉冲发生电路, 提高了脉冲的幅值, 降低了脉冲的时延和宽度, 并通过仿真得以实现。此电路工作稳定, 可靠性高, 通过对电路参数修正, 可适应不同的通信领域。

关键词 [UWB](#) [脉冲](#) [雪崩效应](#)

分类号

Design and research of pulse generation circuit based on UWB in coal mine underground

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Abstract

The present situation of wireless communication in the coal mine underground is introduced. The Ultra WideBand (UWB) wireless communication technology is proposed to be used in the coal mine underground. According to the amplitude-frequency characteristics of UWB pulse, the theory of transistor avalanche effect and its operation principle is analyzed in detail. In this way multi-level parallel and simultaneous trigger narrow pulse generation circuit is designed and realized by simulation, which can increase amplitude of pulse, decrease delay and breadth of pulse. The circuit can work stably and has high reliability, which can be used in different communication fields by correcting its parameters.

Key words [UWB](#) [pulse](#) [avalanche effect](#)

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