

技术及应用

# 辐射伏特效应同位素电池换能单元设计及其性能测试

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**摘要** 以单晶硅基结型器件为基础, 探讨其结构与辐射作用下电输出性能的关系, 为辐射伏特效应同位素电池换能单元(PN结)设计提供依据。设计制作了两种可作为同位素电池换能单元用的单晶硅半导体PN结型器件, 使用<sup>63</sup>Ni源辐照这些器件并测量其电输出性能。结果表明, 新设计的器件具有比原器件更大的开路电压、输出功率和能量转换效率。

**关键词** [辐射伏特效应同位素电池](#) [换能单元](#) [电学性能](#)

分类号

## Design and Performance of Energy Conversion Units of Betavoltaic Isotopic Batteries

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### Abstract

Based on the single crystal silicon semiconductor junction devices, the relationships between their configurable parameters and the electrical properties were discussed for the purpose of design of energy conversion units of betavoltaic isotopic batteries. Two kinds of silicon semiconductor junction devices as energy conversion units of betavoltaic batteries were designed and customized. The electrical output properties of the devices irradiated by <sup>63</sup>Ni source were measured. The results show that the new designed devices perform better than the existing commercial one in open-circuit voltage, output power and energy conversion efficiency.

### Key words

[betavoltaic](#) [isotope](#) [battery](#) [energy](#) [conversion](#) [unit](#) [electrical](#) [property](#)

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