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技术及应用

54HC系列CMOS器件脉冲与稳态γ总剂量效应异同性研究

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摘要 针对现有脉冲辐射模拟装置在模拟真实环境方面累积剂量偏小的特点，开展了54HC系列CMOS器件脉冲γ与^{60}Co γ总剂量效应损伤异同性研究，获取器件效应损伤因子，以期通过对稳态辐射环境下电路总剂量损伤阈值的测量预估脉冲高剂量率环境下的总剂量损伤阈值。研究结果表明，无论选择哪种敏感参数进行效应损伤异同性研究，稳态辐照造成的总剂量损伤总是高于脉冲辐照，即稳态总剂量引起的器件阈值电压漂移、静态功耗电流增加比脉冲总剂量引起的大。

关键词 54HC CMOS 脉冲总剂量损伤 效应损伤因子

分类号

Similarities and Differences Between Pulsed and Steady γ Total Dose Effect in 54HC CMOS Devices

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Abstract The accumulative dose of the existing pulsed radiation facility is smaller than the actual environment dose. Then the studies of similarities and differences between pulsed and ^{60}Co γ total dose damage in 54HC CMOS were carried out. Devices effect damage factor was acquired in order to predict pulsed total dose damage threshold through steady-state total dose damage threshold. Study results indicate that total dose damage due to steady-state irradiation is more serious than that due to pulsed irradiation no matter which sensitive parameters are selected as key factors for damage similarities and differences studies. The threshold voltage shift and static power current due to steady-state total dose is always bigger than that due to pulsed total dose.

Key words 54HC CMOS pulsed total dose damage effect damage factor

DOI

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扩展功能

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