

技术及应用

## 不同偏置下电流反馈运算放大器的电离辐射效应

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**摘要** 在不同偏置条件下, 对基于互补双极工艺生产的电流反馈运算放大器(CFA)进行了高低剂量率下的电离辐射效应研究。研究发现, 在不同偏置条件下, 器件损伤差异明显。在零偏条件下, 器件在低剂量率下损伤显著增强, 表现为低剂量率损伤增强效应(ELDRS); 在小工作电压下辐照时, 器件损伤较小, 且不同剂量率之间损伤差异不明显; 而在大工作电压下辐照时, 器件在高剂量率下的损伤明显大于低剂量率下的损伤, 在随后的室温退火中, 又恢复到与低剂量率损伤相当的程度, 表现为时间相关效应。结果表明, 双极器件是否具有ELDRS效应与实验偏置条件有重要关系。

**关键词** [电离辐射](#) [电流反馈运算放大器](#) [偏置](#) [低剂量率损伤增强效应](#)

分类号

## Ionizing Radiation Effect of Current-Feedback Amplifier Under Different Biases

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**Abstract** Current-feedback amplifier (CFA) based on the complementary bipolar processes was irradiated by <sup>60</sup>Co  $\gamma$  of low and high dose-rates under different biases. The damage varies with the biases and dose-rates. Irradiated with all pins grounded, the device gets more degradation at low dose rate than that at high dose rate. It exhibits enhanced low dose rate sensitivity (ELDRS). But the degradation is small under low supply voltage, and the difference between low and high dose-rates is not obvious. While under high supply voltage, the damage is severer at high dose rate than low dose rate, and it rebounds after irradiation annealing experiment, which is time-dependent effects. The ELDRS of bipolar device is related to the biases during the irradiation.

**Key words** [ionizing radiation](#) [current-feedback amplifier](#) [bias](#) [enhanced low dose rate sensitivity](#)

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