

论文

电子倍增CCD倍增要件研究

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摘要:

讨论了信号载流子倍增寄存器(CCM)结构及其工作原理,在此基础上建立了电子倍增CCD的碰撞电离模型.通过对CCM倍增结构的研究发现实现倍增的三个必要条件:适中的倍增级电场、适当的浅掺杂浓度以及与电子碰撞平均自由程相当的倍增距离.通过建模研究均匀场强中增益情况表明增益因子为0.01时对应的偏置电压接近EMCCD所用倍增电压.

关键词: EMCCD 电子倍增 片上增益 静态感应器件

Multiplication Conditions of EMCCD

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Abstract:

The structure and working rule of Charge Carrier Multiplying register(CCM) are discussed.Based on the discussion,the impact ionization model is established.Three necessary conditions are found by researching the multiplying characters of CCM structure.They are the moderate multiplying voltage,the proper low doping concentration and the impact distance close to the electron mean free path.The results show that the bias voltage is close to that of EMCCD when the gain factor $r=0.01$ by modeling to research the gain condition in uniform field.

Keywords: EMCCD Electron multiplying Gain on chip Static induction transistor

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