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信息科学

外同步式时间延迟积分 CCD传感器模拟装置

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摘要： 由于时间延迟积分(TDI)CCD传感器在调试阶段易损坏,本文提出了一种基于外同步信号驱动原理的TDI CCD传感器模拟装置。该模拟装置实际尺寸可以达到长100 mm,宽45 mm,与实际TDI CCD传感器的物理尺寸相当,可根据实际光照度大小精确地模拟TDI CCD传感器像元感光程度。该装置可以模拟TDI CCD传感器输入引脚的阻容特性并能合成完整的TDI CCD视频输出信号,实现TDI CCD传感器的16、32、48或64级积分级数控制的功能。该装置还可以模拟CCD驱动信号和输出视频信号的温度延时特性,延时时间在0.5~12.5 ns间可调,从而方便了信号采样电路对采样时刻的调试。

关键词： 时间延迟积分(TDI)CCD模拟装置 驱动时钟同步 视频输出 信号合成 像元感光度

TDI CCD simulation instrument synchronized with clocking signals

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Abstract: To avoid the damage of Time Delay and Integration(TDI) CCD sensors in the experimental process, a TDICCD simulation instrument synchronized with input driving clocks is introduced. The simulation instrument is designed with a simple method to meet its physical size in a length of 100 mm and a width of 45 mm. As the size is same as that of a real TDI CCD sensor, the instrument can simulate the photonic characteristics of the pixels for TDI CCD sensors exactly. Furthermore, it can simulate the electrical characteristics of pins in the TDI CCD sensor and can synthesize a complete video output signal, by which an important function, selectable TDI stages with 16,32,48 or 64 stage, is available. Moreover, the instrument can be taken to simulate the thermal delay characteristic between the input driving clock and output OS signals in the temperature adjustable range of 0.5~12.5 ns, which is convenient to the sample time adjustment for the signal circuit.

Keywords: Time Delay and Integration(TDI) CCD simulation instrument driving clock synchronizing video output signal synthesis pixel electro-optical characteristic

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