

主動式 X 光感測器用複晶矽 薄膜電晶體電路之研究

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X 光感測器基於更高解析度與積體電路的整合性，因此我們探究低溫多晶矽薄膜電晶體電路用於感測器上的可行性。在本文中，我們提出一個多工器與新的電荷靈敏放大器用於 X 光感測器的讀取電路，能夠減少電路的輸出信號因薄膜電晶體元件特性如臨界電壓的變異性而導致的變動。當考慮元件的不匹配效應時，此電路也能降低不匹配電壓的偏移量，但是由模擬發現不匹配現象造成的輸出變異比元件特性個別的變動還嚴重，當需要更高位元的 X 光感測影像時，不匹配現象必須適當的被考慮

Study on the LTPS TFT Circuits For X-ray Active Matrix Sensor

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Abstract

The application of low-temperature poly-Si TFT circuits for the high resolution X-ray active matrix sensor is explored. The integration of poly-Si TFT circuit on the glass enables an easy connection for the sensor array with fine pixel pitch. A novel charge sensitive amplifier circuit employing poly-Si TFTs is proposed for the readout system of the active matrix sensor. It can considerably reduce the circuit's sensitivity to unavoidable threshold voltage variations of the poly-Si TFTs. The TFT V_{TH} mismatch which results in the offset voltage of the charge amplifier can also be depressed by the new circuit. However, the noise arisen from the V_{TH} mismatch can be even larger than that from the V_{TH} variation after compensation. For the higher bit digital X-ray image, it must be properly taken into consideration.

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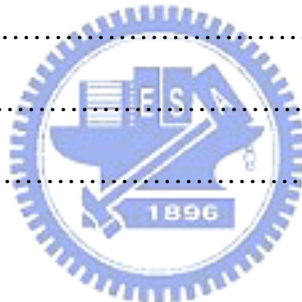
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