A LARGE AREA CCD IMAGER FOR TV APPLICATIONS

R.L. Rodgers, III,* K.H. Zaininger**

ABSTRACT

For a solid-state image sensor to obtain its greatest market potential it should be compatible with and meet the minimum performance parameters of a standard TV system. Many approaches have been taken toward achieving this goal. The most promising approach thus far is a charge-coupled imager which has the potential for meeting both performance and manufacturing requirements. The production experience with silicon vidicon targets will provide a base for the manufacture of solid-state charge-coupled image sensors.

A 512 x 320 element CCD imager containing 163,840 individual analog storage sites has been designed and fabricated. It will offer an attractive alternative to camera tubes for many 525-line television applications, and is capable of supplying the full resolution of colour TV (240 TVL/PH). The features of CCD imagers that are superior to camera tubes are: signal to noise ratio, freedom from lag, and absence of microphonics. The small size, light weight, low power consumption, and precision image characteristics are additional benefits. The performance parameters for this development 512 x 320 CCD imager are summarised below:

(1) Spectral Response Similar to Silicon Vidicon
(2) Operable in SIT-CCD Mode
(3) 500 Nanoamperes DC Maximum Signal
(4) 4 Nanoamperes DC Dark Current at 52°C
(5) Compatible with Standard 525 line TV
(6) Supplies Full Resolution of Colour TV (240 TVL/PH)
(7) No Lag - Picture Erased in One Field

242-262 Lines for 2:1 Interlace

* RCA Electro-Optic Products, Lancaster, Pa.
** RCA Laboratories, Princeton, N.J., USA.