

ABSTRACT OF THE DISCLOSURE

SOLID-STATE IMAGE DEVICE, ITS DRIVING METHOD AND PROCESS FOR ITS MANUFACTURE

A solid-state image device comprises a plurality of photoelectric converters arranged on a semiconductor substrate; a plurality of vertical charge coupled devices (CCDs) that receive signal charges from the photoelectric converters and transfer the signal charges; a horizontal CCD that receives the signal charges transferred by the vertical CCDs and transfers the signal charges in the direction crossing the vertical CCDs; and a signal output circuit that receives the signal charge transferred by the horizontal CCD and outputs the signal voltage corresponding to the signal charge. The vertical CCD has a normal mode for transferring the signal charges synchronizing with the horizontal CCD and a high-speed mode for transferring the signal charges quickly without synchronizing with the horizontal CCD. A potential barrier region (21) and a charge drain region (22) are formed along the side of the horizontal CCD opposite to the connection side with the vertical CCDs. The charge drain region (22) has a resistance R and a capacitance C such that their product value RC is smaller than substantially ten times of the transfer period of the vertical CCD in the high-speed mode.

Figure 1.