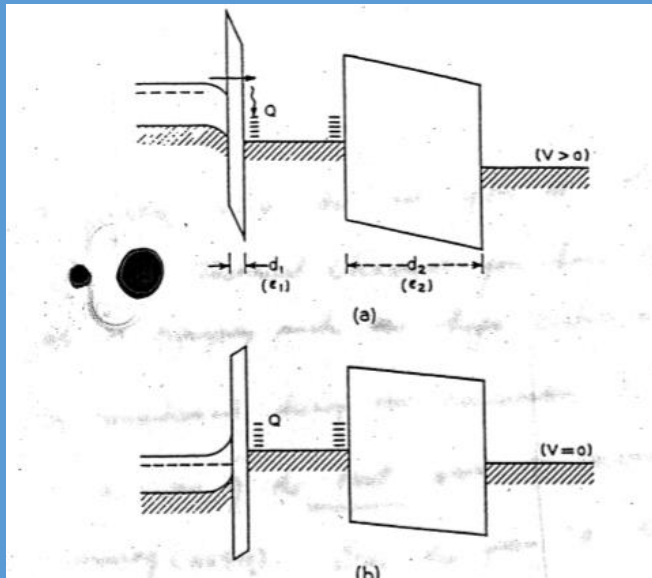


Block (3) the brain nervous cells that store the image information.

NVRAM by Prof. S.M.Sze



A Floating Gate and Its Application to Memory Devices *

By D. KAHNG and S. M. SZE

Bell System Tech. J. 46, 1288 (1967).

A Floating Gate and Its Application to Memory Devices *

By D. KAHNG and S. M. SZE

(Manuscript received May 16, 1967)

A structure has been proposed and fabricated in which semi-permanent charge storage is possible. A floating gate is placed a small distance from an electron source. When an appropriately high field is applied through an outer gate, the floating gate charges up. The charges are stored even after the removal of the charging field due to much lower back transport probability. Stored-charge density of the order of $10^{12}/\text{cm}^2$ has been achieved and detected by a structure similar to an metal-insulator-semiconductor (MIS) field-effect transistor. Such a device functions as a bistable memory with nondestructive read-out features. The memory holding time observed was longer than one hour. These preliminary results are in fair agreement with a simple analysis.

To Dr. Hagiwara
 with compliments &
 best regards
 S.M. Sze

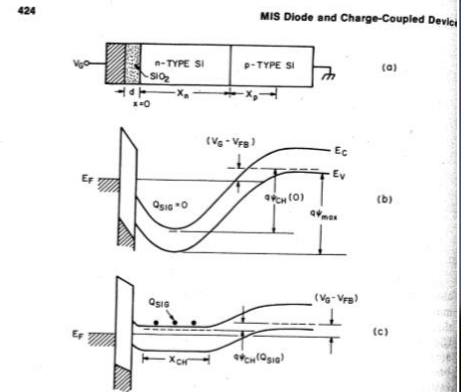
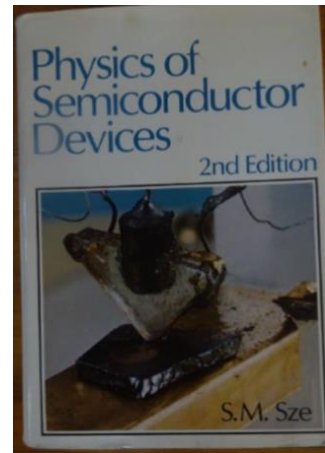


Fig. 53 (a) BCCD. (b) Energy band for an empty well. (c) Energy band when a signal packet is present. (After Burt, Ref. 68.)

Important Contribution to the Modern Digital CMOS Image Sensor Technology

Yoshiaki (Daimon) Hagiwara