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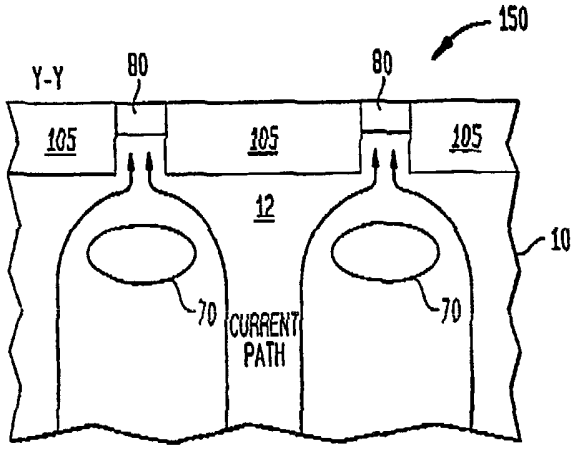
(54) Title: METHOD FOR TRENCH CAPACITOR DRAM CELL WITHOUT FLOATING-WELL EFFECTS



(57) Abstract: A process of forming a hybrid memory cell which is scalable to a minimum feature size, F, of about 60 nm at an operating voltage of V¿blh? of about 1.5 V and substantially free of floating-well effects. In accordance with the present invention, each shallow isolation trench region (105) has a depth that is substantially above the one-sided buried-strap outdiffusion region (70) thereby not cutting into the one-sided buried-strap outdiffusion region, yet being deep enough to isolation adjacent bitline diffusion regions that abut each vertical memory cell. Electrical continuity between the deep portion of the P-well (biased at $V_{bb'}$ typically-0.5V) and the portion of the P-well above the strap is obtained by hole flow around the depletion region surrounding the strap diffusion. In accordance with the present invention, the SIT regions are sufficiently shallow (greater that 40nm above the strap diffusion junction) to allow a non-depletion portion of the P-well to remain between the strap diffusion and the bottom of the SIP. Since the conductive region which provides P-well continuity is original single crystal silicon, junction leakage due to a depletion region abutting a polycrystalline contact is not a concern.

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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H01L21/8242 H01L27/108

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H01L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E	DE 100 38 728 A (INFINEON TECHNOLOGIES AG) 21 February 2002 (2002-02-21) the whole document	1-15
A	US 5 519 236 A (OZAKI TOHRU) 21 May 1996 (1996-05-21) abstract; figures	1-15
A	PATENT ABSTRACTS OF JAPAN vol. 018, no. 080 (E-1505), 9 February 1994 (1994-02-09) -& JP 05 291528 A (TOSHIBA CORP), 5 November 1993 (1993-11-05) abstract	1-15
A	US 5 977 579 A (NOBLE WENDELL P) 2 November 1999 (1999-11-02) abstract; figures	1-15

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☒ Patent family members are listed in annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
25 March 2003	04/04/2003

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Sinemus, M

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Information on patent family members

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