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(71) Applicant (for all designated States except US):
FAIRCHILD SEMICONDUCTOR CORPORATION [US/US]; 82 Running Hill Road, MS 35-4E, South Portland, Maine 04106 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **WANG, Qi** [CN/US]; 10237 Snow Iris Way, West Jordan, Utah 84088-8838 (US). **LI, Minhua** [CN/US]; 9828 South Dolomite Lane, Sandy, Utah 84094 (US). **RICE, Jeffrey, H.** [US/US]; 9388 S. Gentry Park Circle, South Jordan, Utah 84095 (US).

(74) Agents: **SULLIVAN, C. Bart** et al.; Townsend and Townsend and Crew LLP, 2 Embarcadero Center, 8th Floor, San Francisco, California 94111 (US).

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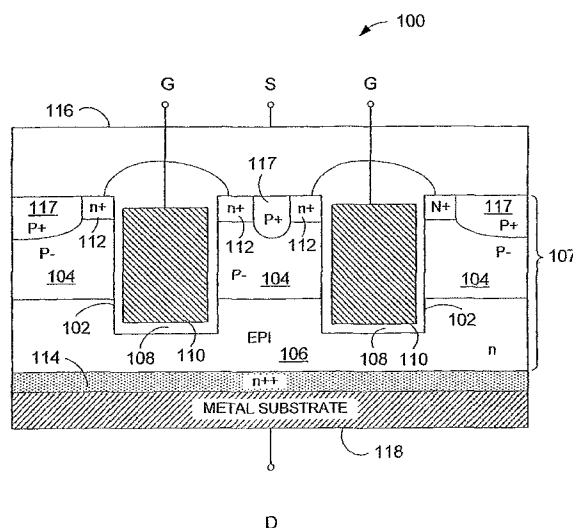
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(54) Title: SEMICONDUCTOR STRUCTURES FORMED ON SUBSTRATES AND METHODS OF MANUFACTURING THE SAME



(57) Abstract: Processes used to transfer semiconductor structures from an initial substrate to a base substrate include bonding the initial substrate with a silicon dioxide layer to a doped silicon structure weakened sufficiently by hydrogen implantation for cleaving. After cleaving, a doped silicon layer remains, burying the silicon dioxide layer between the doped silicon layer and the initial substrate. Semiconductor structures are formed within/on an epitaxial layer disposed on the doped silicon layer forming an intermediate semiconductor structure. A process handle is temporarily bonded to the semiconductor structures for support. The initial substrate is thinned and removed by a mechanical thinning process followed by chemical etching using the buried silicon dioxide layer as an etch stop. The silicon dioxide layer is chemically removed from the doped silicon layer. A base substrate is formed on the doped silicon layer. The process handle is removed leaving the semiconductor structures disposed on the base substrate.

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A. CLASSIFICATION OF SUBJECT MATTER

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USPC: 438/455,458,459,514,515,517,518,522,689

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B. FIELDS SEARCHED

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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 practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y --- Y	US Patent Application Publication 2004/0140479A1 (Akatsu) 22 July 2004 (22.07.2004), figures 2 and 3, paragraphs 42-47 and 55-53. US 5,391,257 (Sullivan et al) 21 February 1995 (21.02.1995), figures 1C, 1D, 2A-2F. US 5,344,524 (Sharma et al) 6 September 1994 (06.09.1994), figures 2, 5 column 5, lines 2-6.	1-6, 8-14
Y --- Y	US Patent Application Publication 2004/0140479A1 (Akatsu) 22 July 2004 (22.07.2004), figures 2 and 3, paragraphs 42-47 and 55-53. US 5,391,257 (Sullivan et al) 21 February 1995 (21.02.1995), figures 1C, 1D, 2A-2F. US 5,344,524 (Sharma et al) 6 September 1994 (06.09.1994), figures 2, 5 column 5, lines 2-6. US 5,877,070 (Gosele et al) 2 March 1999 (02.03.1999), column 11, line 50.	7

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☐ See patent family annex.

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Name and mailing address of the ISA/US
Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
Facsimile No. (571) 273-3201

Authorized officer *Rhonda for Bell*
Quovaunda Jefferson
Telephone No. 571-272-1907

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C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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Y --- Y	US Patent Application Publication 2004/0140479A1 (Akatsu) 22 July 2004 (22.07.2004), figures 2 and 3, paragraphs 42-47 and 55-53. US 5,391,257 (Sullivan et al) 21 February 1995 (21.02.1995), figures 1C, 1D, 2A-2F. US 4,616,408 (Lloyd) 14 October 1986 (14.10.1986), column 2, lines 44-54.	15-17, 19-21, 24, 25
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