

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
31 January 2002 (31.01.2002)

PCT

(10) International Publication Number
WO 02/09149 A3

(51) International Patent Classification⁷: **H01L 21/768**,
21/285

(21) International Application Number: PCT/US01/22566

(22) International Filing Date: 18 July 2001 (18.07.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
09/621,773 21 July 2000 (21.07.2000) US

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(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

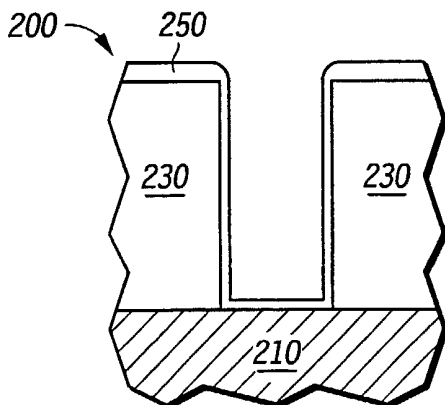
Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:
16 May 2002

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: POST DEPOSITION SPUTTERING



(57) Abstract: A method for improving the conformality and optimizing step coverage in semiconductor features (200) such as vias (200) and trenches is described herein. By performing an additional sputtering step after at least part of the metal (250) has been deposited on a wafer feature, undesirably thick metal deposits near the top and at the bottom of a feature (200) can be reduced. By reducing the overhang at the top of a feature (200) such as a via (200), it is easier for metal species to reach and be deposited on the sidewalls. By reducing the thickness of deposited metal at the bottom of a via (200), via (200) resistance can be decreased. The extra sputtering step may be performed a single time after all metal has been deposited. Alternatively, a small amount of metal may be deposited, a sputtering step may be performed, more metal may be deposited, and additional sputtering steps can be performed.



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INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 01/22566

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H01L21/768 H01L21/285

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, WPI Data, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 297 502 A (HITACHI LTD) 4 January 1989 (1989-01-04) column 1, line 5 -column 4, line 55 column 6, line 1 -column 9, line 5 column 10, line 7 -column 11, line 4; figures 1-5,10,15,23 ---	1,2,8,9, 13-17
X A	US 5 963 832 A (SANDHU GURTEJ ET AL) 5 October 1999 (1999-10-05) column 6, line 24 - line 62 column 7, line 43 - line 54 column 8, line 51 -column 9, line 58; figures 5,14,15 ---	1-3,8-10 6,7,11, 12
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Further documents are listed in the continuation of box C. Patent family members are listed in annex.

° Special categories of cited documents :

<p>*A* document defining the general state of the art which is not considered to be of particular relevance</p> <p>*E* earlier document but published on or after the international filing date</p> <p>*L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>*O* document referring to an oral disclosure, use, exhibition or other means</p> <p>*P* document published prior to the international filing date but later than the priority date claimed</p>	<p>*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>*Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>*G* document member of the same patent family</p>
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Date of the actual completion of the international search 20 March 2002	Date of mailing of the international search report 03/04/2002
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Name and mailing address of the ISA 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	Authorized officer Micke, K
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INTERNATIONAL SEARCH REPORT

Inter. Patent Application No

PCT/US 01/22566

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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A	<p>HASHIM I ET AL: "IMP TA/CU SEED LAYER TECHNOLOGY FOR HIGH ASPECT RATIO VIA FILL BY ELECTROPLATING, AND ITS APPLICATION TO MULTILEVEL SINGLE DAMASCENCE COPPER INTERCONNECTS" PROCEEDINGS OF THE SPIE, SPIE, BELLINGHAM, VA, US, vol. 3508, 1998, pages 58-64, XP000910780 the whole document</p>	1-12,18,19
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