

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
31 March 2005 (31.03.2005)

PCT

(10) International Publication Number
WO 2005/029556 A2

(51) International Patent Classification⁷: **H01L**
(21) International Application Number:
PCT/US2004/030816
(22) International Filing Date:
17 September 2004 (17.09.2004)
(25) Filing Language: English
(26) Publication Language: English
(30) Priority Data:
60/504,368 19 September 2003 (19.09.2003) US
10/943,033 16 September 2004 (16.09.2004) US

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(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, 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, NA, NI, NO, NZ, OM, PG,
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,
ZW.

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,
FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI,
SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
GW, ML, MR, NE, SN, TD, TG).

Published:

— without international search report and to be republished
upon receipt of that report

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

(54) Title: METHOD OF FILLING STRUCTURES FOR FORMING VIA-FIRST DUAL DAMASCENE INTERCONNECTS

(57) Abstract: A method of forming via-first, dual damascene interconnect structures by using a gapfilling, bottom anti-reflective coating material whose thickness is easily controlled by a solvent is provided. After application to a substrate, the bottom anti-reflective coating is partially cured by baking at a low temperature. Next, a solvent is dispensed over the coated wafer and allowed to contact the coating for a period of time. The solvent removes the bottom anti-reflective coating at a rate controlled by the bot-
tom anti-reflective coating's bake temperature and the solvent contact time to yield a bottom anti-reflective coating thickness that is thin, while maintaining optimum light-absorbing properties on the dielectric stack. In another possible application of this method, sufficient bottom anti-reflective coating may be removed to only partially fill the vias in order to protect the bottoms of the vias during subsequent processing. The solvent is removed from the wafer, and the bottom anti-reflective coating is cured completely by a high-temperature bake. The wafer is then coated with photoresist, and the trench pattern exposed. The bottom anti-reflective coat-
ing material used maintains a greater planar topography for trench patterning, eliminates the need for an inorganic light-absorbing material layer on the top of the dielectric stack, protects the bottom of the vias during the trench etch, and prevents the formation of
fencing problems by using a solvent to control the thickness in the vias.



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