22/09/03

200305302 2

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

162162

(43) International Publication Date
10 October 2002 (10.10.2002)

PCT

(10) International Publication Number
WO 02/080234 A3

(51) International Patent Classification[7]: H01L 21/027, 21/768, 21/311

(21) International Application Number: PCT/US02/06650

(22) International Filing Date: 21 March 2002 (21.03.2002)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
09/820,737 30 March 2001 (30.03.2001) US

(63) Related by continuation (CON) or continuation-in-part (CIP) to earlier application:
US 09/820,737 (CON)
Filed on 30 March 2001 (30.03.2001)

(71) Applicant *(for all designated States except US)*: **LAM RESEARCH CORPORATION** [US/US]; 4650 Cushing Parkway, Fremont, CA 94538 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **NI, Tuqiang** [CN/US]; 5415 Ontario Common, Fremont, CA 94555 (US). **JIANG, Weinan** [CN/US]; 3089 Etruscan Drive, San Jose, CA 95135 (US). **CHIANG, Conan** [US/US]; 1028 Yorkshire Drive, Los Altos, CA 94024 (US). **LIN, Frank, Y.** [CN/US]; 34489 Winslow Terrace, Fremont, CA 94555 (US). **LEE, Chris** [US/US]; 1523 Valley Road, Kensington, CA 94707 (US). **LEE, Dai, N.** [US/US]; 38000 Camden Street, Apt. 61, Fremont, CA 94536 (US).

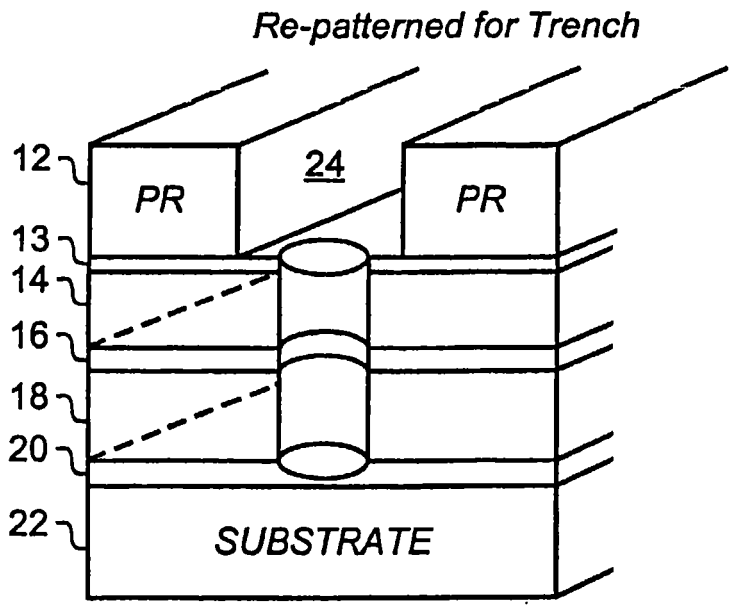
(74) Agents: **PETERSON, James, W.** et al.; Burns, Doane, Swecker & Mathis, LLP, P.O. Box 1404, Alexandria, VA 22313-1404 (US).

(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, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, 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).

[Continued on next page]

(54) Title: METHOD OF PLASMA ETCHING ORGANIC ANTIREFLECTIVE COATING



(57) Abstract: A semiconductor manufacturing process wherein an organic antireflective coating is etched with an O_2-free sulfur containing gas which provides selectivity with respect to an underlying layer and/or minimizes the lateral etch rate of an overlying photoresist to maintain critical dimensions defined by the photoresist. The etchant gas can include SO_2 and a carrier gas such as Ar or He and optional additions of other gases such as HBr. The process is useful for etching 0.25 micron and smaller contact or via openings in forming structures such as damascene structures.

WO 02/080234 A3

ACTION

Published:
— *with international search report*

(88) Date of publication of the international search report:
1 May 2003

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.