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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
2 March 2006 (02.03.2006)

PCT

(10) International Publication Number
WO 2006/023318 A1

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

(21) International Application Number:
PCT/US2005/028149

(22) International Filing Date: 8 August 2005 (08.08.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/925,501 24 August 2004 (24.08.2004) US

(71) Applicant *(for all designated States except US)*: **MICRON TECHNOLOGY, INC.** [US/US]; 8000 South Federal Way, P.O. Box 6, Boise, ID 83716-9632 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **OLIVER, Steven, D.** [CA/US]; 2233 E. Roanoke Avenue, Boise, ID 83712 (US). **KIRBY, Kyle, K.** [US/US]; 10681 N. Sagecrest Place, Boise, ID 83703 (US). **HIATT, William, M.** [US/US]; 1137 West Stafford Drive, Eagle, ID 83616 (US).

(74) Agent: **PARKER, Paul, T.**; Perkins Coie LLP, P.O. Box 1247, Seattle, WA 98111-1247 (US).

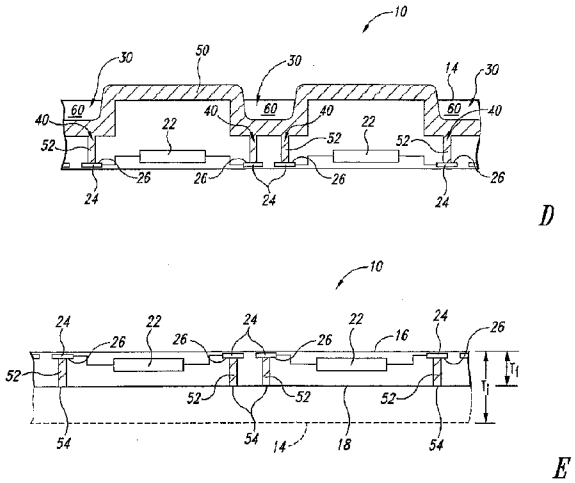
(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, 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, IS, IT, LT, LU, LV, 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:
— *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*

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:** METHODS FOR FORMING INTERCONNECTS IN VIAS AND MICROELECTRONIC WORKPIECES INCLUDING SUCH INTERCONNECTS



(57) **Abstract:** Methods for forming interconnects in blind vias or other types of holes, and microelectronic workpieces having such interconnects. The blind vias can be formed by first removing the bulk of the material from portions of the back side (14) of the workpiece without thinning the entire workpiece. The bulk removal process, for example, can form a first opening (30) that extends to an intermediate depth within the workpiece, but does not extend to the contact surface (26) of the electrically conductive element. After forming the first opening, a second opening (40) is formed from the intermediate depth in the first opening to the contact surface of the conductive element. The second opening has a second width less than the first width of the first opening. This method further includes filling the blind vias with a conductive material and subsequently thinning the workpiece from the exterior side until the cavity (30) is eliminated.

WO 2006/023318 A1