

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
6 March 2008 (06.03.2008)

PCT

(10) International Publication Number
WO 2008/027968 A1

(51) International Patent Classification:
H01L 21/56 (2006.01) **H01L 21/68** (2006.01)

(21) International Application Number:
PCT/US2007/077115

(22) International Filing Date: 29 August 2007 (29.08.2007)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
11/469,256 31 August 2006 (31.08.2006) US

(71) Applicant (for all designated States except US): **ATI TECHNOLOGIES ULC** [CA/CA]; 1 Commerce Valley Drive East, Markham, Ontario L3T 7X6 (CA).

(72) Inventors: **CHAN, Vincent**; 83 Sun Valley Drive, Richmond Hill, Ontario L4S 2G6 (CA). **TOPACIO, Roden**; 7 Karma Road, Markham, Ontario L3R 4S8 (CA).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **MCLELLAN, Neil** [US/CA]; 2 Rean Drive #2104, Toronto, Ontario M2K 3B8 (CA).

(74) Agent: **RECKAMP, Christopher J.**; Vedder Price Kaufman & Kammholz, 222 N. LaSalle Street, Chicago, IL 60601 (US).

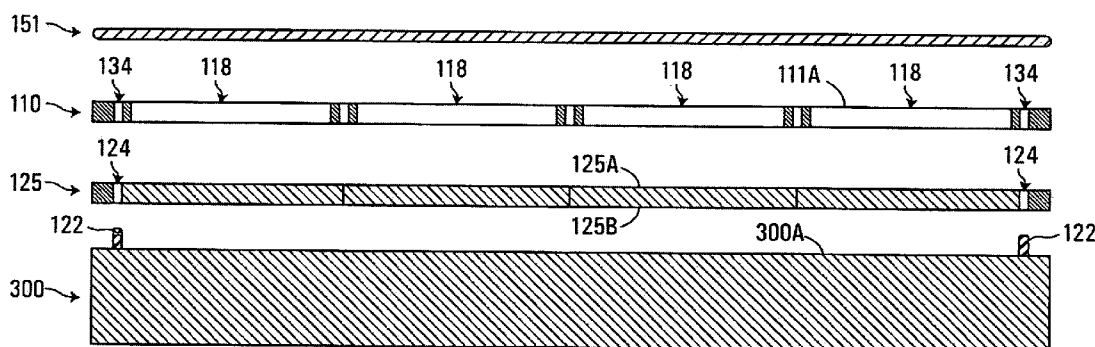
(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, 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, MT, 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

(54) Title: METHOD AND APPARATUS FOR MAKING SEMICONDUCTOR PACKAGES



(57) Abstract: A method of packaging a plurality of semiconductor chips comprises: providing a substrate panel having a first coefficient of thermal expansion (CTE); providing a carrier having a second CTE that is less than the first CTE; heating the substrate panel and the carrier to first and second elevated temperatures respectively; mounting the substrate panel at about the first elevated temperature to the carrier, the carrier being at said second elevated temperature, to provide a connection between the carrier and the substrate panel; and cooling the carrier and the substrate panel from the first and second elevated temperatures thereby putting the substrate panel into tension in at least one direction. A stiffener panel may be affixed to the substrate panel and heated to an elevated temperature and while the substrate panel is heated to an elevated temperature. A plurality of dies may be mounted and electrically connected to the substrate panel. Under-filling of the plurality of dies may occur with the stiffener panel affixed to the substrate panel.



WO 2008/027968 A1