



(51) International Patent Classification:

H01L 21/58 (2006.01) *H01L 23/31* (2006.01)
H01L 23/495 (2006.01) *H01L 21/68* (2006.01)

(21) International Application Number:

PCT/US2010/035763

(22) International Filing Date:

21 May 2010 (21.05.2010)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

12/472,675 27 May 2009 (27.05.2009) US

(71) Applicant (for all designated States except US): **MI-CROCHIP TECHNOLOGY INCORPORATED** [US/US]; 2355 West Chandler Blvd., Chandler, AZ 85224-6199 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **KENGANAN-TANON, Ekgachai** [TH/TH]; 37/23 Moo. 4 T. Srikan A. Donmuang, Bangkok, 10210 (TH). **SAWATJEEN, Surapol** [TH/TH]; 49/90 Moo. 3 T. Bangkhen A. Laksi, Bangkok, 10210 (TH).

(74) Agent: **SLAYDEN, Bruce, W.**; King & Spalding LLP, 401 Congress Ave., Suite 3200, Austin, TX 78701 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, 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, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, 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, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

[Continued on next page]

(54) Title: SEMICONDUCTOR DIE ATTACHMENT METHOD USING NON-CONDUCTIVE SCREEN PRINT AND DISPENSE ADHESIVE

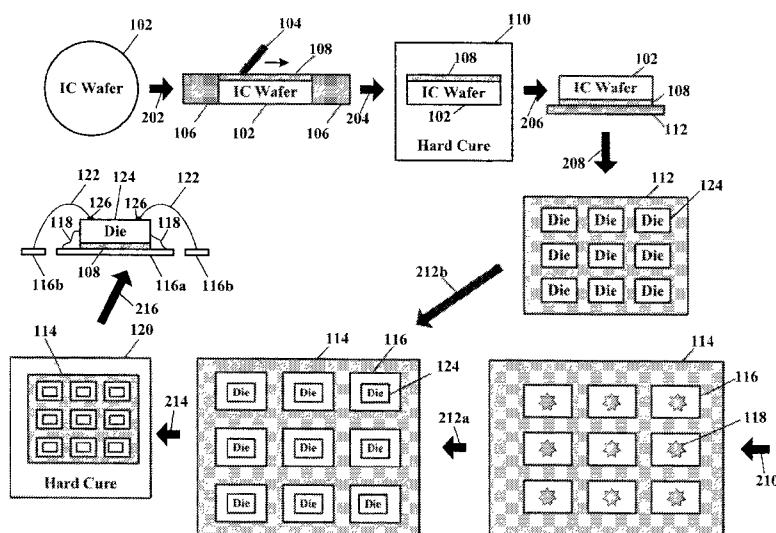


FIGURE 1

(57) Abstract: A uniform layer of non-conductive material, (108) e.g., epoxy, is screen printed onto the backside of an integrated circuit wafer (102) to a required thickness, and then heated until it is hard cured (C-stage) (110). The integrated circuit wafer having the hard cured coating is then sawn apart to separate the individual integrated circuit dice (124). A non-conductive adhesive is dispensed onto mating faces of die attach paddles (116a) of lead frames (116). The dice are placed into the non-conductive adhesive and then the die and die attach paddle assembly are heated to hard cure the adhesive (118) between the mating faces of the die and die attach paddle. This provides long-term electrical isolation of the integrated circuit die from the die attach paddle, and effectively eliminates silver migration from the die attach paddle which causes conductive paths to form that increase unwanted leakage currents in the die and ultimately cause failure during operation thereof.



(88) Date of publication of the international search report:

26 May 2011