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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
20 October 2005 (20.10.2005)

PCT

(10) International Publication Number
WO 2005/096731 A2

(51) International Patent Classification: Not classified

(21) International Application Number:
PCT/US2005/010550

(22) International Filing Date: 29 March 2005 (29.03.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/557,889 30 March 2004 (30.03.2004) US

(71) Applicant *(for all designated States except US)*: **HONEYWELL INTERNATIONAL INC.?** [US/US]; 101, Columbia Road, P.O. Box 2245, Morristown, NJ 07962 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **DEAN, Nancy, F.** [US/US]; 3658 Wagner Ridge Ct, Ann Arbor, MI 48103 (US). **RASIAH, Ignatius, J.** [MY/SG]; 7 Farrer Road, #01-04 Tulip Gardens, Singapore 268817 (SG).

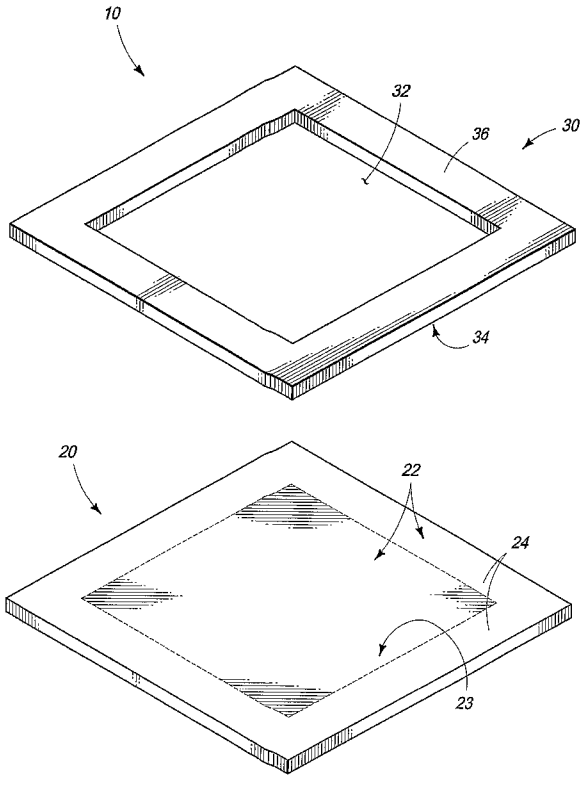
(74) Agents: **LATWESEN, David, G.** et al.; Wells, St. John P.S., 601 W. First Ave. # 1300, Spokane, WA 92201 (US).

(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, 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, 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, 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).

[Continued on next page]

(54) Title: HEAT SPREADER CONSTRUCTIONS, INTEGRATED CIRCUITRY, METHODS OF FORMING HEAT SPEADER CONTRUICTIONS, AND METHODS OF FORMING INTEGRATED CIRCUITRY



(57) Abstract: The invention includes a heat spreader having a base which has a perimeter surface surrounding a heat-receiving region. A frame portion interfaces the perimeter surface and has an opening traversing a thickness of the frame. The invention includes a method of forming a heat spreader construction by forming a base portion having a perimeter region surrounding a heat-receiving surface. An independent frame portion is joined to the base portion. The invention includes integrated circuitry having a heat spreader construction in thermal communication with a heat-generating device. The heat spreader has a base having a heat-receiving surface and a perimeter surface which interfaces a frame portion. The invention includes methodology for forming integrated circuitry which includes providing an integrated circuitry board having a heat generating device mounted thereon, and providing a multi-part heat spreader in thermal communication with the heat-generating device.

WO 2005/096731 A2

Declaration under Rule 4.17:

— *of inventorship (Rule 4.17(iv)) for US only*

Published:

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

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.