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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
20 September 2001 (20.09.2001)

PCT

(10) International Publication Number
WO 01/69680 A3

(51) International Patent Classification[7]: H01L 25/10, 23/32

(21) International Application Number: PCT/US01/07926

(22) International Filing Date: 13 March 2001 (13.03.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
09/524,324 13 March 2000 (13.03.2000) US

(71) Applicant *(for all designated States except US)*: **LEGACY ELECTRONICS, INC.** [US/US]; 1001 Calle Amanecer, San Clemente, CA 92673 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **KLEDZIK, Kenneth, J.** [US/US]; 43 Via Sonrisa, San Clemente, CA 92673 (US). **ENGLE, Jason, C.** [US/US]; 2400 South Ola Vista, San Clemente, CA 92673 (US).

(74) Agent: **REED, Randall, L.**; Levin and Hawes, LLP, 384 Forest Ave, Suite 13, Laguna Beach, CA 92652 (US).

(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, 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, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

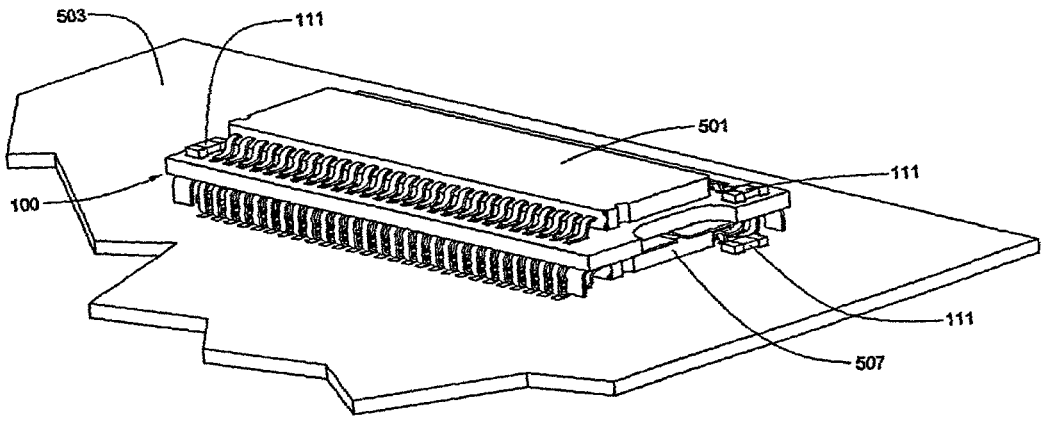
(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*

(88) Date of publication of the international search report:
21 March 2002

[Continued on next page]

(54) Title: ELECTRONIC MODULE HAVING A THREE DIMENSIONAL ARRAY OF CARRIER-MOUNTED INTEGRATED CIRCUIT PACKAGES



(57) Abstract: A package carrier (100) for increasing the circuit density on printed circuit boards (503). The package carrier (100) mounts on a printed circuit board (503) on top of a first integrated circuit package (507) that is also mounted on the printed circuit board (503). The carrier (100) has an upper major surface (102U) having a pad array on which a second integrated circuit package (501) is mountable. The carrier (100) has a plurality of leads by means of which the carrier (100) is surface mounted to the printed circuit board (503). Each carrier lead is also electrically connected to a single pad of the pad array on the upper surface (102U). The integrated circuit package (507) beneath the carrier (100) shares all or most printed circuit board (503) connections in common with the carrier (100) and consequently the integrated ciurcut package (501) mounted upon the carrier (100). The carrier (100) also includes heat sink or heat disipation structures.

WO 01/69680 A3

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.