(19) World Intellectual Property Organization

International Bureau



(10) International Publication Number WO 2012/030470 A3

(43) International Publication Date 8 March 2012 (08.03.2012)

- (51) International Patent Classification: *H01L 25/065* (2006.01)
- (21) International Application Number:

PCT/US2011/046519

(22) International Filing Date:

4 August 2011 (04.08.2011)

(25) Filing Language:

English

(26) Publication Language:

English

US

(30) Priority Data:

12/874,446 2 September 2010 (02.09.2010)

- (71) Applicant (for all designated States except US): ORA-CLE INTERNATIONAL CORPORATION [US/US]; 500 Oracle Parkway, Redwood Shores, CA 94065 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): HARADA, John A. [US/US]; 531 Church Street, Mountain View, California 94041 (US). DOUGLAS, David C. [US/US]; 334 Byron Street, Palo Alto, California 94301 (US). DROST, Robert J. [US/US]; 2211 Via Maderas, Los Altos, CA 94024 (US).
- (74) Agent: SAHASRABUDDHE, Laxman; 2820 Fifth Street, Davis, California 95618 (US).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

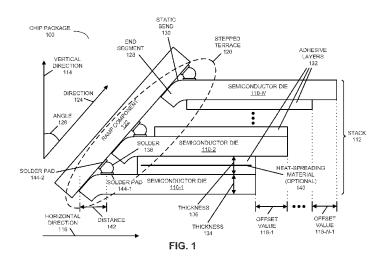
- AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, 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, RS, 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))
- (88) Date of publication of the international search report:

3 May 2012

(54) Title: RAMP-STACK CHIP PACKAGE WITH STATIC BENDS



(57) Abstract: A ramp-stack chip package is described. This chip package includes a vertical stack of semiconductor dies or chips that are offset from each other in a horizontal direction, thereby defining a terrace with exposed pads. A high-bandwidth ramp component, which is positioned approximately parallel to the terrace, is electrically and mechanically coupled to the exposed pads. For example, the ramp component may be coupled to the semiconductor dies using: solder, microsprings and/or an anisotropic conducting film. Furthermore, each of the semiconductor dies includes a static bend so that an end segment of each of the semiconductor dies is parallel to the direction and is mechanically coupled to the ramp component. These end segments may facilitate high-bandwidth communication of signals between the chips and the ramp component, for example, via proximity communication.





INTERNATIONAL SEARCH REPORT

International application No PCT/US2011/046519

	FICATION OF SUBJECT MATTER H01L25/065				
According to	o International Patent Classification (IPC) or to both national classifica	ation and IPC			
B. FIELDS	SEARCHED				
Minimum do H01L	ocumentation searched (classification system followed by classification	on symbols)			
	tion searched other than minimum documentation to the extent that so				
	ata base consulted during the international search (name of data bas	se and, where practical, search terms used)			
C. DOCUME	ENTS CONSIDERED TO BE RELEVANT				
Category*	Citation of document, with indication, where appropriate, of the rele	evant passages	Relevant to claim No.		
А	US 6 376 904 B1 (HABA BELGACEM [US] ET AL) 23 April 2002 (2002-04-23) figures 7A-7D		1-20		
А	EP 1 028 463 A1 (TOSHIBA KK [JP]) 16 August 2000 (2000-08-16) claim 1; figures 5A-6C		1-20		
Further documents are listed in the continuation of Box C. X See patent family annex.					
"A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but		"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. "&" document member of the same patent family			
Date of the actual completion of the international search		Date of mailing of the international search report			
	2 March 2012	21/03/2012			
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer Cortes Rosa, João			

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2011/046519

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
US 6376904	B1	23-04-2002	US US	6376904 B1 6621155 B1	23-04-2002 16-09-2003
EP 1028463	A1	16-08-2000	EP TW US	1028463 A1 460927 B 6392143 B1	16-08-2000 21-10-2001 21-05-2002