



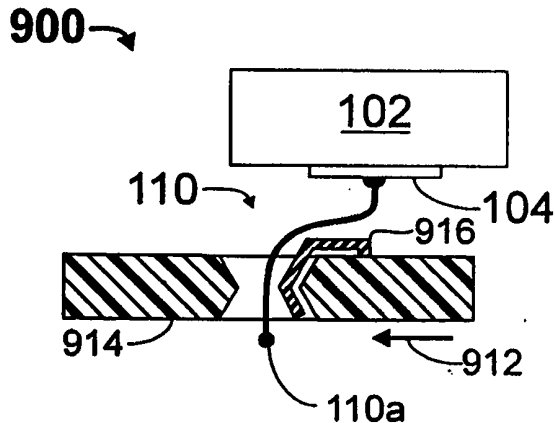
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification ⁶ : H01L 23/48, G01R 1/04</p>	<p>A3</p>	<p>(11) International Publication Number: WO 99/00844 (43) International Publication Date: 7 January 1999 (07.01.99)</p>
<p>(21) International Application Number: PCT/US98/13692 (22) International Filing Date: 30 June 1998 (30.06.98) (30) Priority Data: 60/051,365 30 June 1997 (30.06.97) US (71) Applicant (for all designated States except US): FORMFAC-TOR, INC. [US/US]; 5666 La Ribera Street, Livermore, CA 94550 (US). (72) Inventors; and (75) Inventors/Applicants (for US only): DOZIER, Thomas, H., II [US/US]; 5801 Arlene Way, Livermore, CA 94550 (US). ELDRIDGE, Benjamin, N. [US/US]; 651 Sheri Lane, Danville, CA 94526 (US). GRUBE, Gary, W. [US/US]; 6807 Singletree Court, Pleasanton, CA 94588 (US). KHAN-DROS, Igor, Y. [US/US]; 25 Haciendas Drive, Orinda, CA 94563 (US). MATHIEU, Gaetan, L. [CA/US]; 659 Orange Way, Livermore, CA 94550 (US). PEDERSEN, David, V. [US/US]; 6 Sterling Lane, Scotts Valley, CA 95066 (US). STADT, Michael, A. [US/US]; 3610 Andrews Drive #204, Pleasanton, CA 94558 (US). (74) Agents: OKAMOTO, James, K.; Fenwick & West LLP, Two Palo Alto Square, Palo Alto, CA 94306 (US) et al.</p>		<p>(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, 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), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i> (88) Date of publication of the international search report: 29 April 1999 (29.04.99)</p>

(54) Title: SOCKETS FOR SEMICONDUCTOR DEVICES WITH SPRING CONTACT ELEMENTS

(57) Abstract

Temporary connections to spring contact elements extending from an electronic component such as a semiconductor device are made by urging the electronic component, consequently the ends of the spring contact elements, vertically against terminals of an interconnection substrate, or by horizontally urging terminals of an interconnection substrate against end portions of the spring contact elements. A variety of terminal configurations are disclosed.



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INTERNATIONAL SEARCH REPORT

Intern. Application No
PCT/US 98/13692

A. CLASSIFICATION OF SUBJECT MATTER IPC 6 H01L23/48 G01R1/04		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols) IPC 6 H01L G01R		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practical, search terms used)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 96 17378 A (FORMFACTOR INC) 6 June 1996 cited in the application see figures 12D,22E,28,29 ---	1-12
A	WO 92 20203 A (GEN DATACOMM IND INC) 12 November 1992 see the whole document ---	1-12
A	WO 94 23475 A (GEN DATACOMM IND INC) 13 October 1994 see the whole document ---	1-12
A	US 3 676 832 A (JUDGE ROBERT L ET AL) 11 July 1972 see the whole document ---	1-12
A	EP 0 422 584 A (AMP INC) 17 April 1991 see the whole document ---	1-12
-/--		
<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C. <input checked="" type="checkbox"/> Patent family members are listed in annex.		
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Date of the actual completion of the international search <p style="text-align: center;">11 March 1999</p>		Date of mailing of the international search report <p style="text-align: center;">17.03.99</p>
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016		Authorized officer <p style="text-align: center;">Bekkering, R</p>

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 98/13692

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 950 980 A (PFAFF WAYNE K) 21 August 1990 see the whole document -----	1-12

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 98/13692

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-12

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-12

Method and device wherein the spring contact is urged "horizontally" against the terminal of the substrate.

2. Claims: 13-17

Method wherein the spring contact is urged "vertically" against the terminal of the substrate.

INTERNATIONAL SEARCH REPORT

Information on patent family members

Intern. Application No

PCT/US 98/13692

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