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(54) Title: SEMICONDUCTOR INTERCONNECT HAVING ADJACENT RESERVOIR FOR BONDING AND METHOD FOR FORMATION

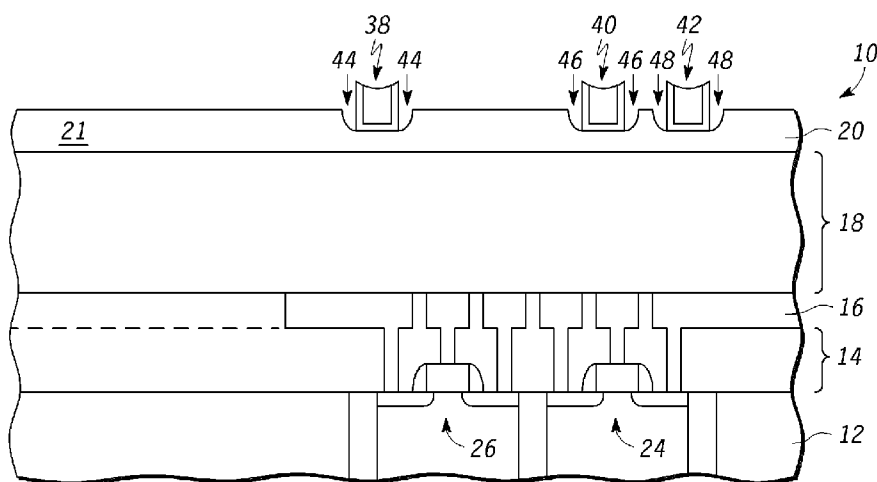


FIG. 7

(57) Abstract: A semiconductor device (10) and method has interconnects (38, 40, 42) with adjoining reservoir openings (44, 46, 48). A dielectric layer (20) is formed as part of an uppermost of the one or more interconnect layers (18). Openings (30) formed in the dielectric layer result in modified portions (32) of the dielectric layer along portions of sidewalls of the openings. The openings are filled with a conductive material, such as metal. An exposed portion (22) of the dielectric layer (20) is removed to form protruding pads (38, 40, 42) of the conductive material extending above the dielectric layer. Reservoir openings are formed adjacent the protruding pads by removing the modified portions of the dielectric layer. When the semiconductor device is bonded with another device (100), either a wafer or a die, laterally flowing metal collects in the reservoir openings and ensures that a reliable electrical connection is made between the semiconductor device and the other device.

WO 2007/100404 A3

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 06/61737

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - H01 L 23/48 (2008.04)

USPC - 257/734

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)

USPC - 257/734, 438/667; 438/455; 438/599; 438/675;

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

USPC - 257/734, 438/667; 438/455; 438/599; 438/675;

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

PubWEST (USPT, PGPB, EPAB, JPAB); DialogPRO (Engineering); Google Scholar

Search term: semiconductor device, integrated circuit, IC, device, component, Interconnect\$3 layer, interlevel layer, dielectric layer, pad, opening

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 6,887,769 B2 (KELLAR et al.) 03 May 2005 (03.05.2005), fig 2-3, col 4 ln 24-26, col 5 ln 25-29	1-4,7-10,12,15-20 ----- 5-6,1 1,13-14
Y	US 5,817,572 A (CHIANG et al.) 06 October 1998 (06.10.1998), fig 20, col 17 ln 19-30, ln 52-68	5-6, 11, 14
Y	US 2002/0160596 A1 (WEINRICH et al.) 31 October 2002 (31.10.2002), para [0044]	6
Y	US 6,232,219 B1 (BLALOCK et al.) 15 May 2001 (15.05.2001), abstract	13

D Further documents are listed in the continuation of Box C.



\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

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