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(12)

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10-2004-0083726
2004 10 06

(21) 10-2003-0018296
(22) 2003 03 24

(71) 6 806

17-11 402

(72) 6 806

17-11 402

(74)

:

(54)

가

가 , 가

가

가

9f

- 1 (cantilever) (probe needle) (probe card)
- 2 (solder ball)
- 3
- 4a 4b , 4c
- 5
- 6
- 7
- 8
- 9a 9f
- 10
- 11a 11f (via hole)
- 12a 12d

가 (cantilever) (Microprobe)

e) (Semiconductor Integrated Circuit Device)

(pad) 가 (probe needle)

가

1 (5) (1) 가 (1) 6,087,840 (opening)(3) (1)

(5) (1) 가 32

(5) 65 μm 가 (5) (1)

가 6,114,864 2
 (21) (22)가 (23) (21) (2)
 5) (23) 가 (22) (23) (19)
 (solder ball)(27) (22) (25) (23) (19)
 (25) (27) (21) (25) 2

가 6,059,982
 3 (31) (41) (42)가 (43) (41)
 (44) (41) (stud)(45)가 (47) (48) (49) (51)
 (3)

가 6,520,778 4a 4b
 (71) (60) (61) (70)
 (80) (73) (81),(82) (60) (81) 4c
 90) (91)가 (90),(92)가 (93) (95) (92) 가
 가 (95) (94)가 (95) (97)가 (82) (99)가 (95) (92) (94)
 (98) (98) 4a 4c 가가 (soldering)

가 6,491,968 5
 (100) (101) (110) (111)가 (112)가 (111)
 (leaf) (113) 가 (113) (115)가 5
 4 (113)

가 (: 27658) 6
 (121) (123) (125) 가 (121) (125) (125)가
 (129)가 (127) (121) (125)
 6 (125) (125) (129)

가 7 (130) 4c

65 μm 가 가 μm 가
 32 가 가

가

가 , ; 가 가 1
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 가
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 ; 3
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amethylammonium hydroxide), KOH, EDP(Ethyl Diamine Pyrocatechol) TMAH(Tetr

1
 가 1 ;
 ; 1
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 , / , .
 , .

8
 0) , , (200) 가 (30

(203) (207) (200) 가
 (215)가 (207) (215)
 (400) (401) (219)가 (200) (200)
 (300) (300) (207) (215)가 (2)
 00) 1 (pad)

(200) SOI(Silicon-On-Insulator) , SOG(Spin-On-Glass)

(207) (Cu) (Ni) ()
 (200) , TEOS(tetraethylorthosilane)

(215) (219) (Ni-W) (Ni-Cr) (W)

가 가 가 μm
 가 가 가

() 가
 100mN 100 100mN
 1 가

9a 9a 9f 10
 (200) (200)

9a SOI(Silicon-On-Insulator) , SOG(Spin-On-Glass)

(203) (203) (203) (200)
 11a (203) 11a 11f (200) (203)
 (203) 100 μm (203) 가 200 μm ~1000 μm (203)
 (205) (200) 2 (205) (205) (203) 1 (203)
 (207) (200) TEOS 가 (203) 2 (20)

5) 11b (200) (205)
 (204) (204) (Ti)/ (Au), (Ti)/ (Cu), (Cr)/ (Au), (seed) (204)
 (204) (204) (W) (Cu)

11c (204) 11d (200)
 (PR) (207a) (207a), (Cu) (200)
 () (204) (203) (204) (20)

) (Ni) (204) (207a) (204)

3) (204) (207a)

7) (215)

(215) (218) (215) (219) 3

(215) (219)가 (215)

(215) (217)

9e (219)가 9d (217) (215)

(211) (215) (211) (215)

(215) (215)

9f (211) (215) (215) (215) (215)

(200) (215) (221) (203) (215) (215)

가 (215) (219) (200) (215)가 가 100mN

hechol) TMAH(Tetramethylammonium hydroxide), KOH, EDP(Ethyl Diamine Pyrocat
(Inductively Coupled Plasma: ICP) (Reactive Ion Etching: RIE)

(215)가 (200) 1

10a 10d (SEM)

8 (300)

()

8 (401)가 (219), (400) (401) (215) (219)

(401)가 (300) (215), (207) () (300) (400)

가 100mN 가

가 가 가 가 μm

가 32 가 가

(flip-chip bonding)

가

가 , 가 , 가 . ; 가 .
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(57)

1. 가 , ;
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1 가 ; 가
가 .

2. , 가 , - , - , , 가
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3. , 가 , , - , - , , 가
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6 7. , ;

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7 8.

8 9.

6 10.

10 11.

11 12.

6 13.

13 rocatechol) 14.

13 15.

6 16.

16 17.

3

TMAH(Tetramethylammonium hydroxide), KOH, EDP(Ethyl Diamine Py

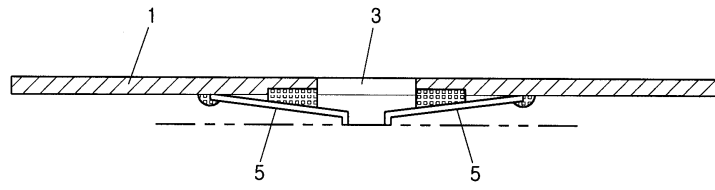
가

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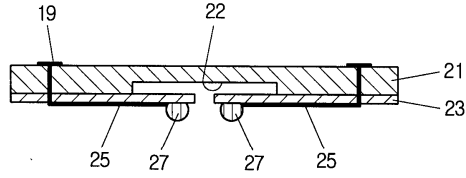
1

1

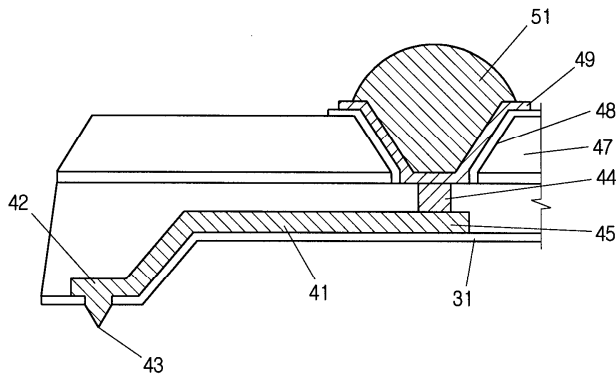
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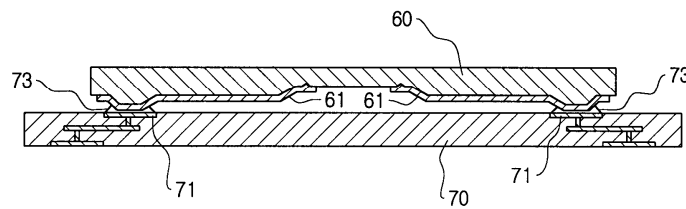
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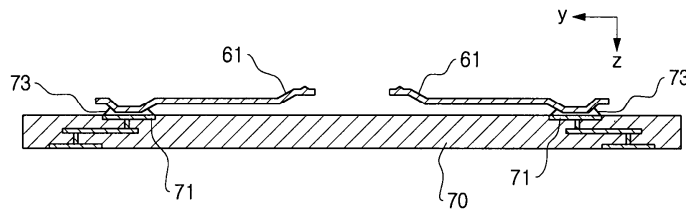
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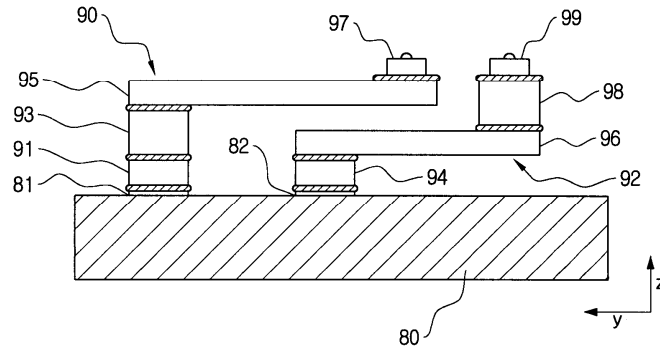
4a



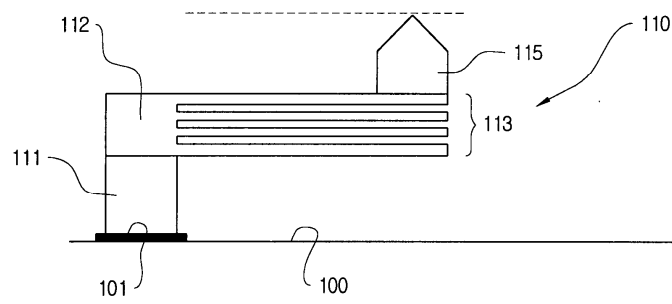
4b



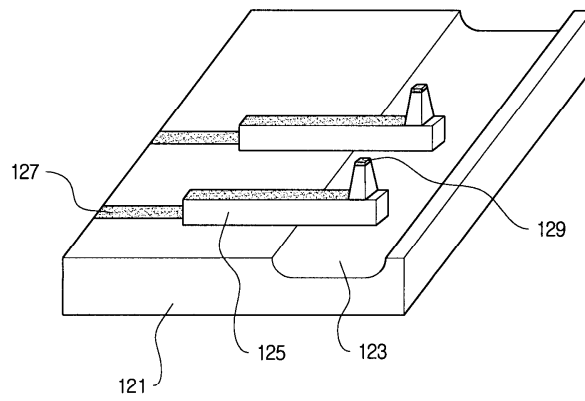
4c



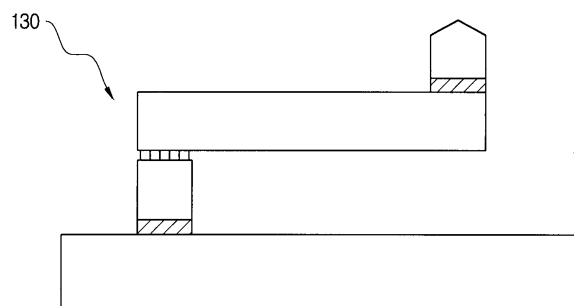
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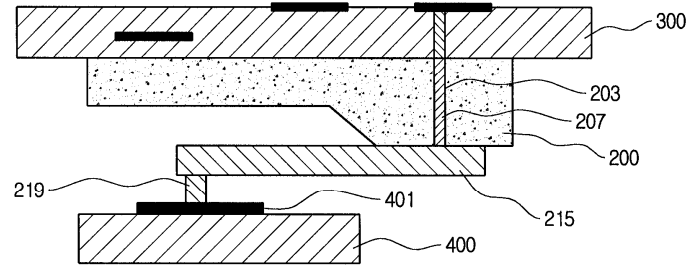
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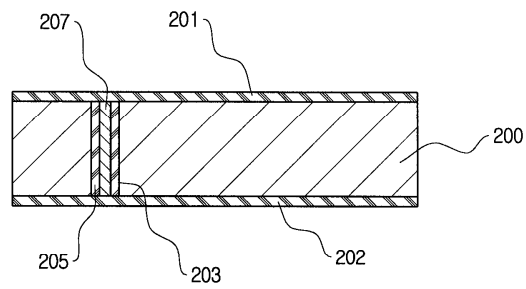
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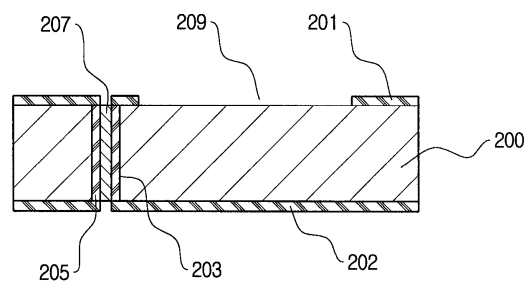
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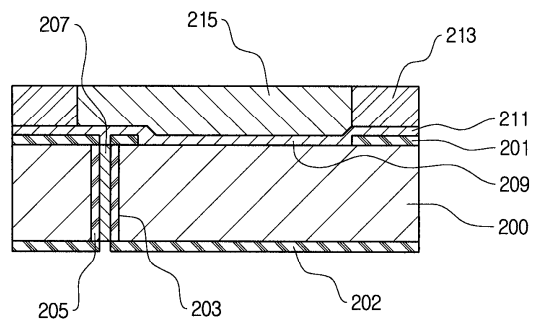
9a



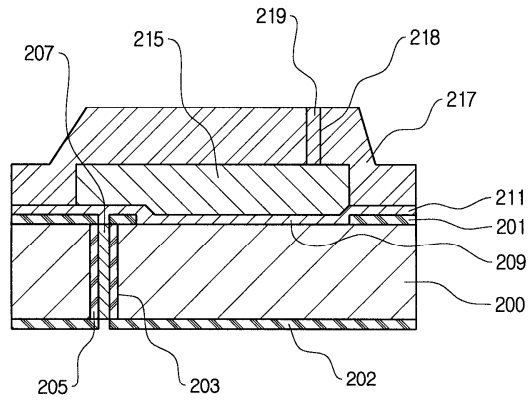
9b



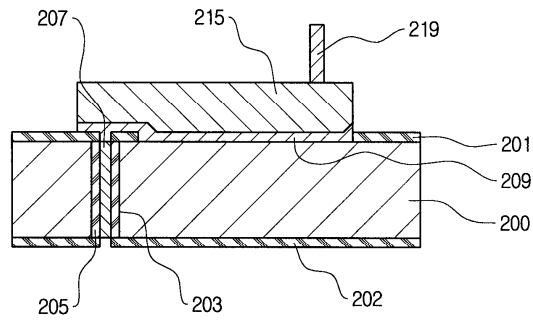
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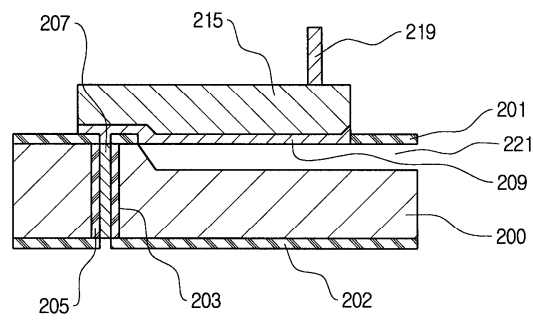
9d

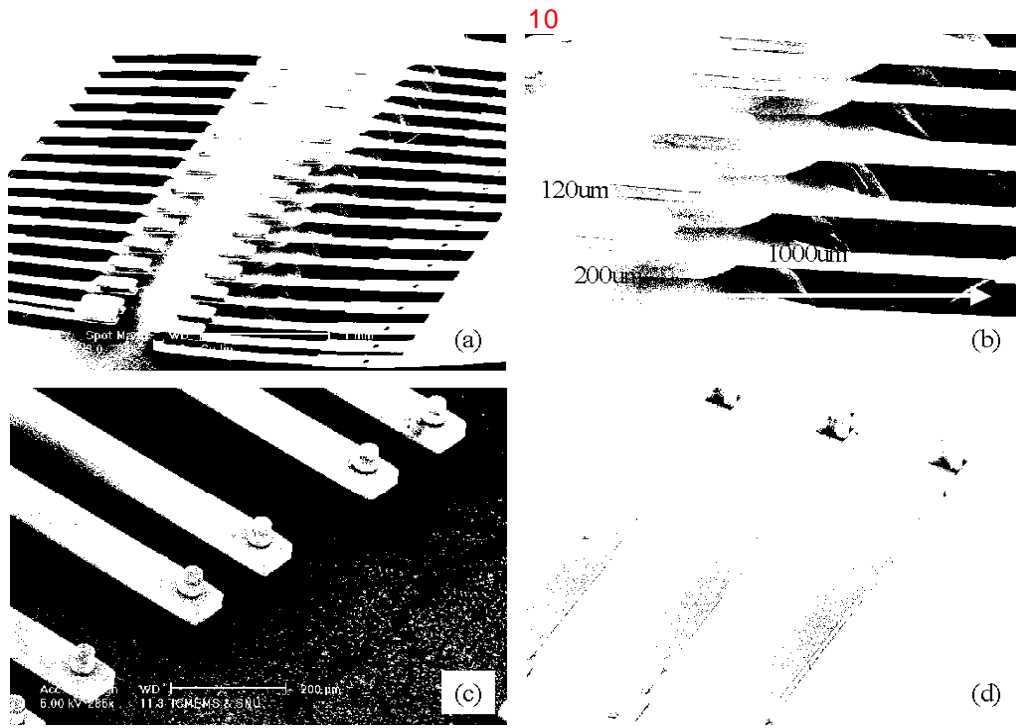


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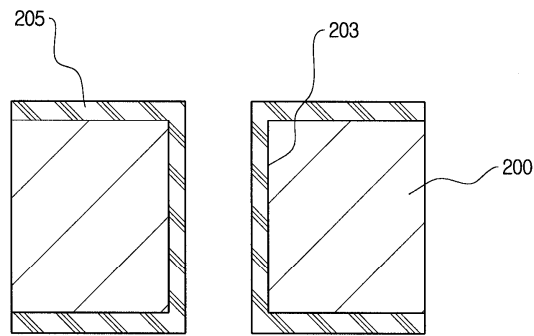


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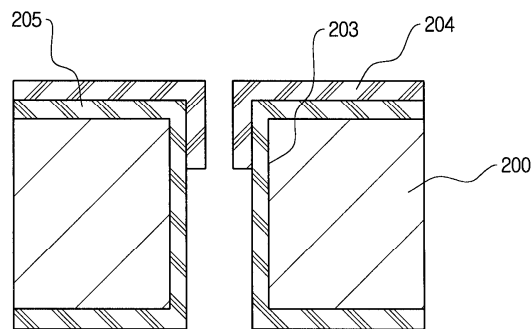




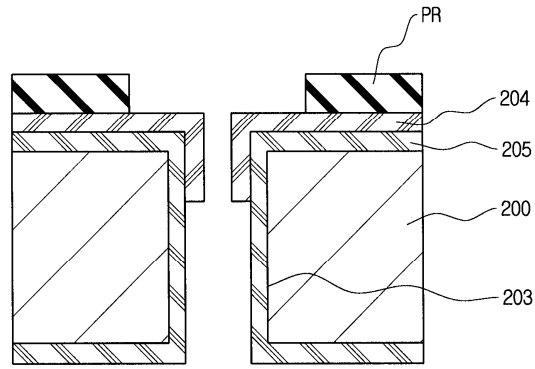
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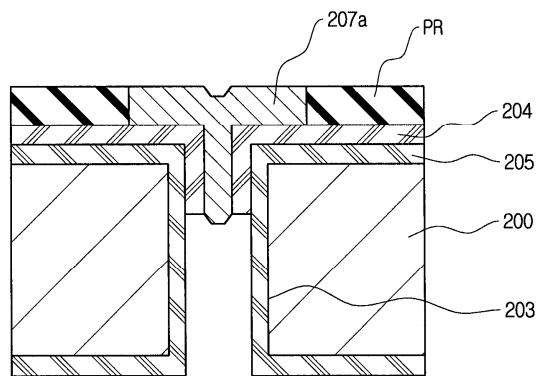
11b



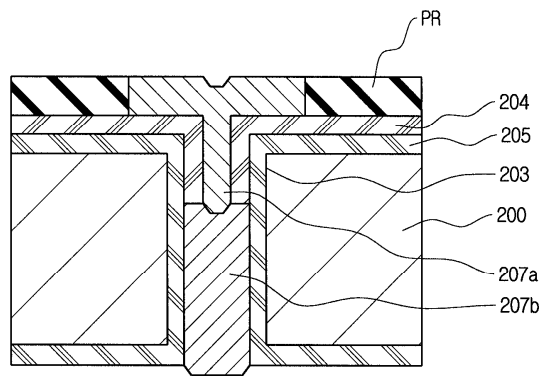
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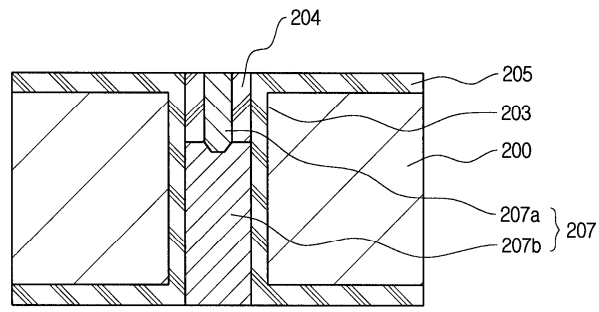
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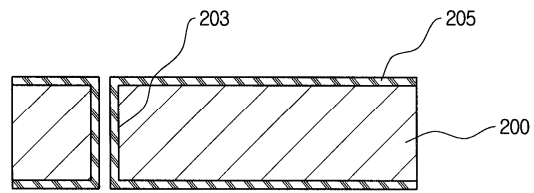
11e



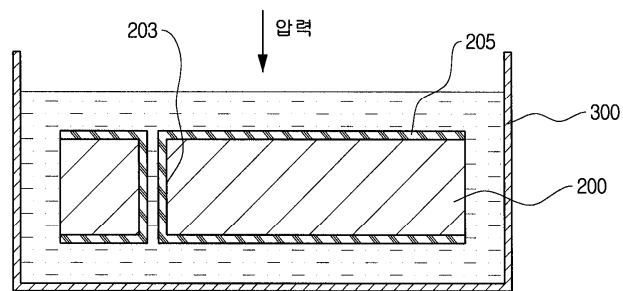
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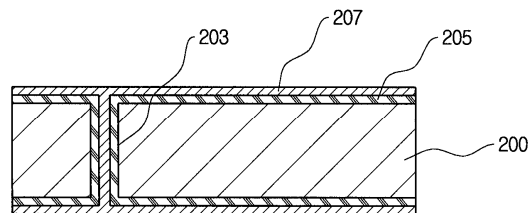
12a



12b



12c



12d

