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639 - 1124 50 - 21

(74)

(54)

, (reverse)
, (first) ,
, (second) , , , , ,

1 1

2 1

3 2

4(a) 1

4(b) 1

5(a) 1

5(b) 1

5(c) 1

6 4(a),4(b) 5(a),5(b),5(c)

7(a) 4(a)

7(b) 4(b)

8 1

9(a)

9(b)

10(a) , (capillary)

10(b) ,

가

, , ,
(ball bonding) (; nail - head bonding) , (gold wire)
(wedge)

, 9(a) , , , (1) , , (2,3) (4) (flat lenth) La Lb
, , , (1) (4) Lc가 가 , 가 .

, 9(b) , (2,3) (1) 가
La가 , Lb , Lc
. (4) 가 , Lc가
, Lc , (2,3) ,

가 .

2 , 2 (first bonding)
(second bonding)

(second bonding)

(first bonding)

2

가

2

가

2

2

가

가

가

)

(

가

가

가

1

1 8

1 , 1 (1), 2 (2) 3
 3 (3) (4) .
 (1,2,3) (4) (6) .

, Lb가 (6)가 , Lh , (6) 가 (1,2,3)
, (6) 가 , (4)

가 (1,2), (1,2), (2,3), (2,3), (5'), (1,2,3) (5') 가

$$, \quad 2 \quad \quad \quad , \quad \quad \quad (2,3) \quad \quad (4) \quad , \quad 1 \quad \quad (1) \quad \quad (4) \quad .$$

, , (1) (5) (4) , (2) , (1) (4) (7) . , 2 (2) (5') . (4) (5) , (2) (5') , (2) (6) . , 2 , 3 (3) (4) (6) .

$$\begin{array}{ccccccccc}
 , & (2,3) & & (5') & & , & (7) & , & (2) \\
 (4) & & (6), & (3) & (4) & & (6) & , & \\
 & & & (5') & & & & & \text{가}
 \end{array}$$

$$, \quad , \quad (6) \quad (5') \quad \text{가} \quad , 1$$

$$(6) \quad (5') \quad .$$

$$, \quad 1 \quad \quad \quad (1) \quad \quad \quad (7) \quad \quad \quad , \quad 2 \quad \quad \quad (2,3) \\ (6) \quad \quad \quad , \quad 1 \quad \quad \quad (7) \quad \quad \quad 2 \quad \quad \quad (6) \\ , \quad 1 \quad \quad \quad (\quad \quad \quad)$$

3
(6)가 (4) , (4) (1) , (4) (1) , (4) (2) (7)
(4) (1) , (4) (1) , (4) (1) , (4) (2) (6)
7) (4) (2) , (4) (1) , (4) (1) , (4) (2) (7) ()
. , (4) (1) , (4) (1) , (4) (2) (7) ()
Tr , () , (4) , (4) (2) (7) ()
(1,2) , . , . , () , (4) , (4) (2) (7) ()
D

$$, \quad (6) \quad (1) \quad , \quad 1 \quad (7) \quad (4)$$

가 , , ,

$$, \quad \quad \quad , \quad 1 \quad \quad \quad (1) \quad \quad \quad 2 \quad \quad \quad (2) \\ \text{가} \quad \quad \quad , \quad 1 \quad \quad \quad (1) \quad \quad \quad (7) \quad \quad \quad , \quad 2 \\ (2,3) \quad \quad \quad (6) \quad \quad \quad .$$

$$\begin{array}{ccccccccc}
, & 6 & & , & 1 & 2 & (1,2) & (4) & , \\
(1) & (4) & (& &) (8) & , & (1,2) & (1,2) & , \\
(1) & (4) & & . & . & . & . & . & . \\
, & 4(a) & , & (4) & 3 & (1) & (3) & (4) & (1) \\
(2) & & . & , & 3 & (1) & (3) & (4) & (1) \\
& & . & . & . & . & . & . & .
\end{array}$$

, , 1 (1) (5') . , (4)
 (5) , (1) (5') (5')
 , (4) (1) (6') . , 2 (5') (2)
 (5) , (1) (5') (5')
 (5') , (1) (2) (7') . ,
 3 (3) (5') , (4) (5)
 , (3) (5') , (4)
 , (6) . , (6') (7') .

, 4(b) , 2 3 (2,3) , , (1)
 (4) , , (2) (4) , , (3)
 (2) .

, (1) (4) , (1) (4) , Lc2가 Lc1 (4(a)) ,

5(a) 5(c) , (1,2,3) SRAM(static random ac
cess memory) , (3) (2) , (2)
(1) , (1) (4) 가 .

5(a) , , (2) (5') . , (3) (5')
, , (2) (5') . , (1)
, (3) (2) (7') . , (5)
(5') . , (2) (5') (5') (5)
(1) (5') (1) (5') , (2)
(1) (7') . , (1) (5') (5)
5) , (4) , , (1) (5)
4) (7) .

가 1 (7,7') , , (2)
 가 () .

5(b) , , (2) (5') . , (3) (5) , , (2) (5') (5') . , (5') (5') (1) (1) (5') . , (4) (5) (5) , , (4) (1) (1) (6) . , (2) (5') (5') (5') (5) , (1) (1) (7') (2) (1) (7') , (1) (4) (6) .

, (2) (1) (7') , (1) (7') 가
가 . , (3) (2) (3) (2) (2) 가 . , (2) (7') (7') (2) (2) 가 . ,

$$5(c) \quad , \quad , \quad (2) \quad (5') \quad . \quad , \quad (3) \quad (5)$$

$$, \quad (2) \quad (5') \quad (5') \quad , \quad (5')$$

, (3) (2) (7') . , (1)
 (5') . , (4) (5') (5) , (1) (1)
 (5') , , (6) (1) (5') (5') (5)
 (6) . , (2) (5') , (5') (5)
 2) (1) (6') . , (4)

, (2) (1) (6') , (2) , (1)
 , (1) (6) 가 가 (6) . , 5(a),(b) ,

, 7(a) 7(b) , (1, 2, 4(a),(b), 5(a),
 (b),(c)) , (4) (9) , (10)
 , . 7(a) 7(b) 4(a) 4(b)

, , , CSP(chip size package)

, 가 , 가 . , , 8 , , 2
(2') 1 (1) () . .

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(3 D).

， ， 가 ， ，

(57)

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2 , 2

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3 2 , 2

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3.

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4.

1 2 ,

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5.

2 ,

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3 ,

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3

6.

5

7.

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3

3

8.

7

9.

2

3

3

3

10.

9

11.

1 2

12.

1 2 , 2

13.

1 2 , 3

14.

1 2

15

14

16

가

2

가

18.

17

,

가

가

,

가

19.

16

17

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가

가

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가

가

20.

17

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가

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22.

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3

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17

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22

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가

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24.

17 ,

3

3

3

25.

24 , ,

가

26.

16 17 ,

27.

16 17 , 2

28.

16 17 , 3

29.

16 17 , 가

30.

29 ,

31.

16 17 , , 가

32.

16 17 ,

33.

16 17 ,

34.

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2 , 2

35.

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2 , 2

↗, 2

36.

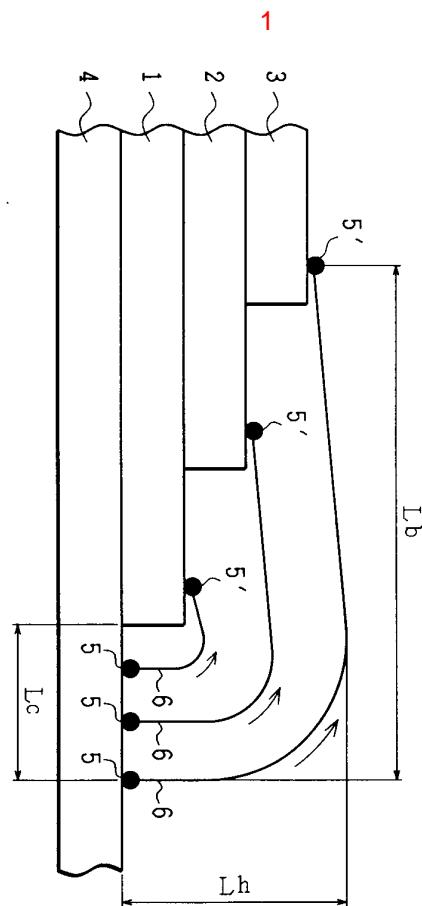
34

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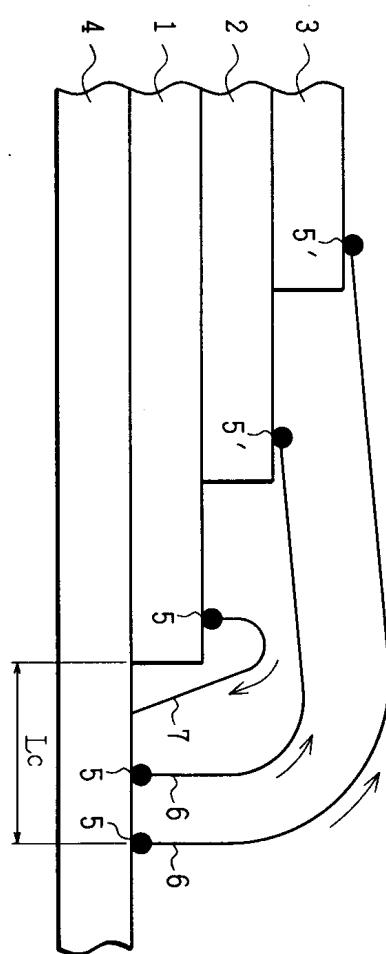
37.

35

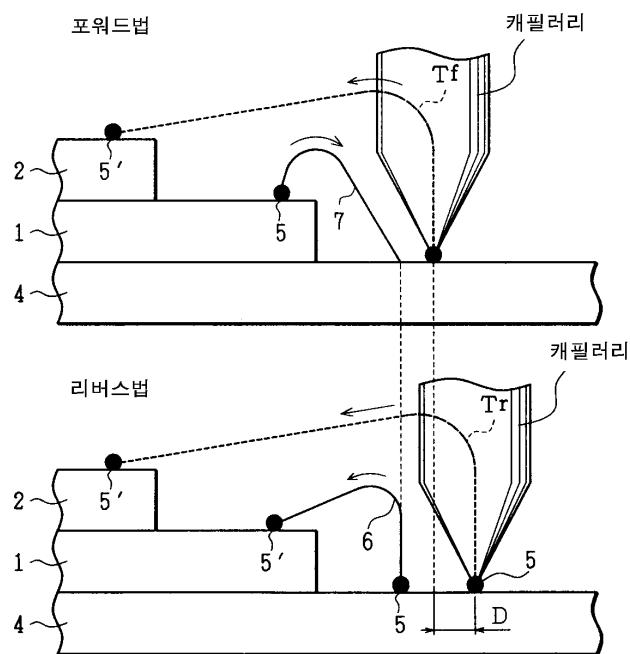
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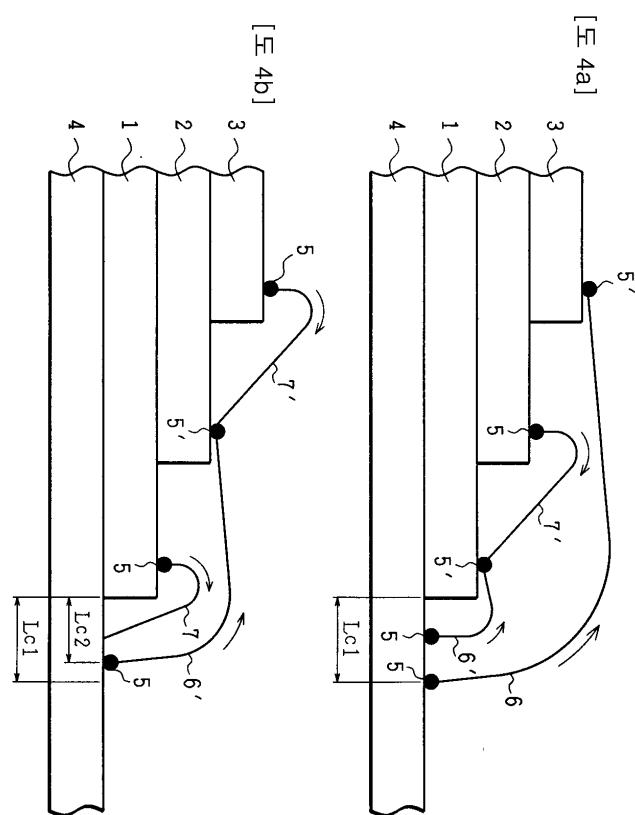
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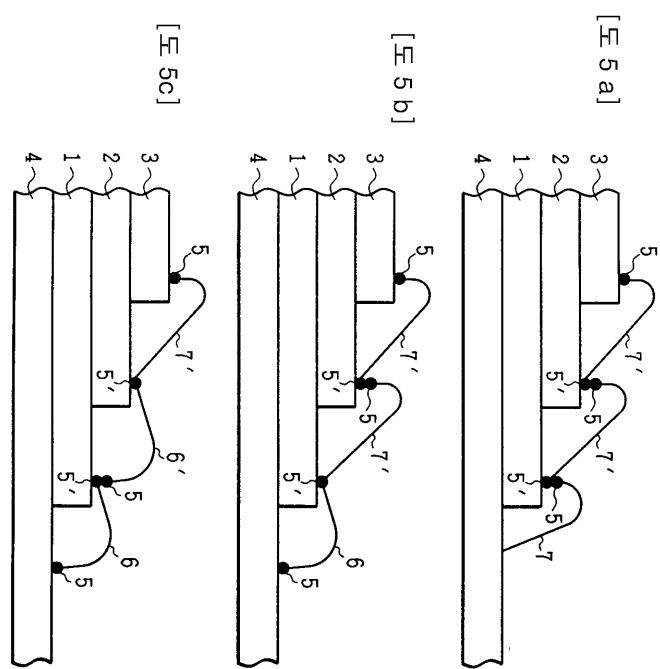
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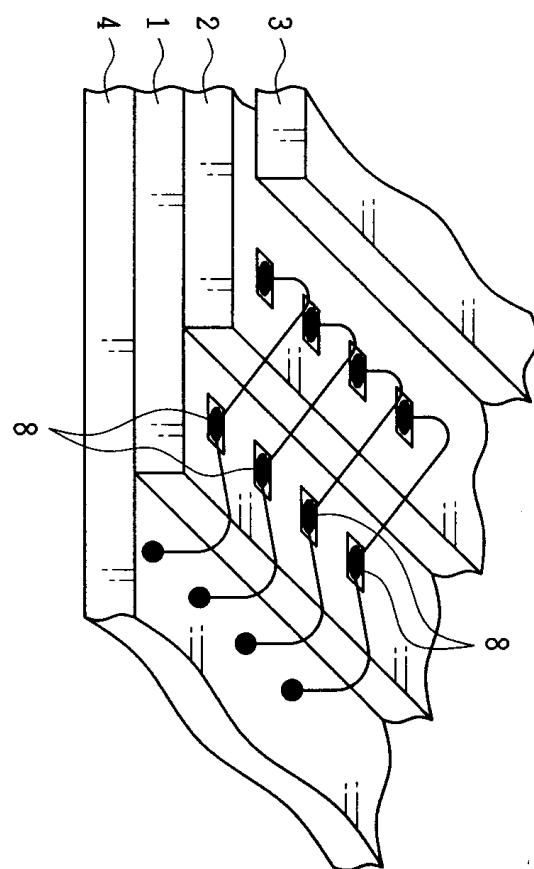
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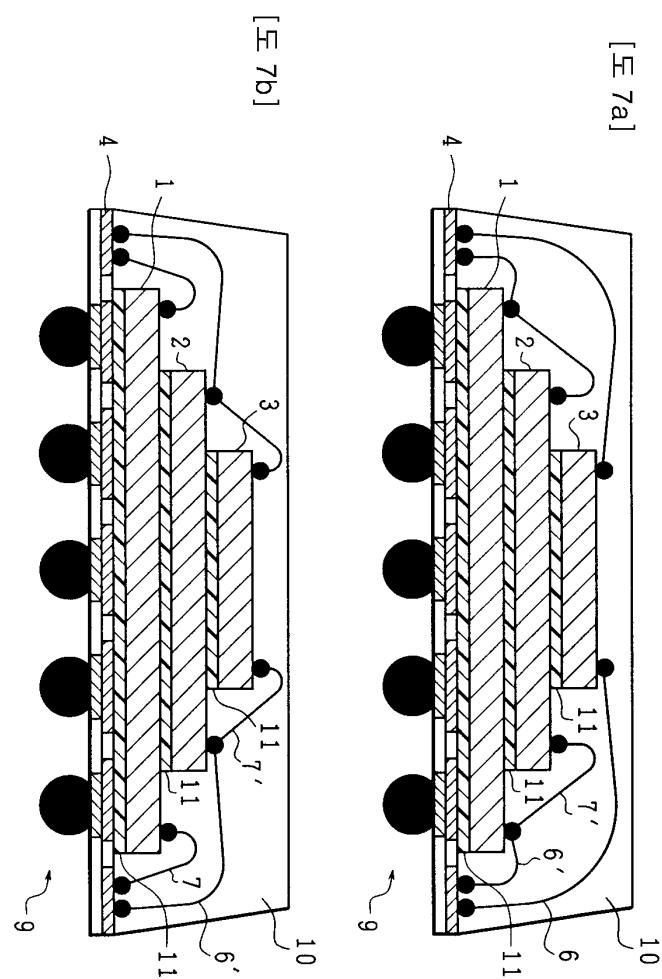
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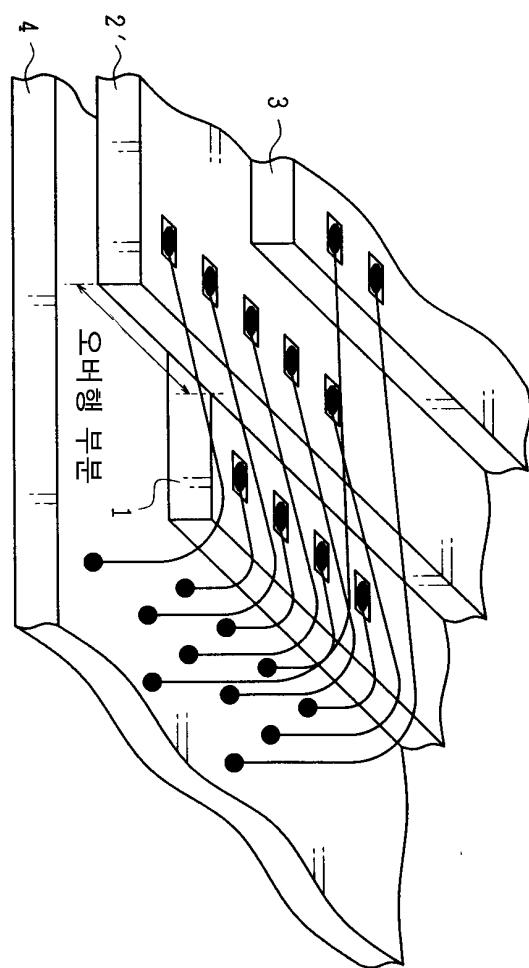
6



7

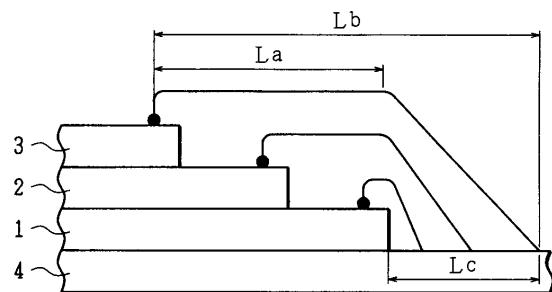


8

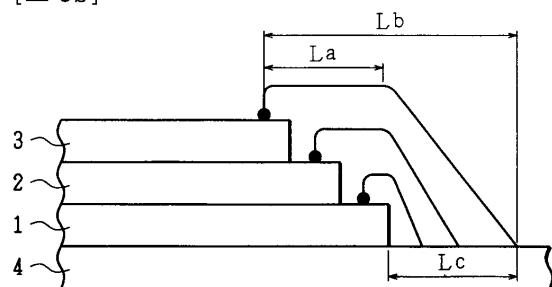


9

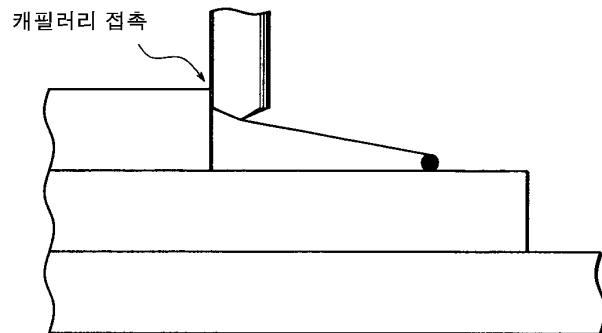
[도 9a]



[도 9b]



[도 10a]



[도 10b]

