

(19)
(12)

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10 - 0376357
2003 03 05

(21) 10 - 2000 - 0048496
(22) 2000 08 22

(65)
(43)

2001 - 0070028
2001 07 25

(30) 11 - 242035 1999 08 27 (JP)

(73) 211 - 8668 가 가 가 1753

(72) 5 7 - 1 가 가

(74)

:

(54)

(solder ball)

가

5

1 1

2 1

3	1	.
4	1	.
5	1	.
6	1	.
7	2	.
8	2	.
9	2	.
10	2	.
11	3	.
12	3	.
13	3	.
14	3	.
15	3	.
16	3	.
17	15	.
18	3	.
19		.
20	19	.

<

11 : 12 : SiO₂ ()

13 : SiON () 15 :

16 : 17 :

18 : 19 :

20 : 21, 28 : TiW

21a, 22, 27 : 21A : 21B : 23 : 24 : 25, 26 : 29 :

가 가 , 가 가
 (, LSI) 가 가
 , LSI , LSI ,
 ball grid array (FCBGA) , LSI LSI (flip chip)
 (Cu)

FCBGA 10 - 261642 19

(31) (41) , (41) (33)
 (33) (41) (38) , (38)
 (38) (39) , (39) (34) (38) Ti, T
 iW, Cr, TiN , (39) Cu

(34) (39)
 (39) (38) (39) Cu (wettability) (39)
 anium) (38) (34) , Cu 가 , Cu , Ti(Tit)
 (39) Ti (38)

가 (34) (Sn)(43) 20 (3
 4) (39)가 Sn (43)가 , (39) , (3
 9) (38) Sn (43) (34)
 (39) Sn (43)가

(39) 가
 19 , Sn 20 (39) Sn (43)가 , (39)
 (38) Sn (43)가
 (38) (39) (38) Sn (43)가 , (39)

355 365 ()
 , 20 (39) (38) 가 (42)가 . (42)가
 가 , (34) , 가 ,

1
 2
 3
 1 1
 2 2
 1 2
 가

1 (11)
 (Al) (15) Al (Cu), Al Cu (15) 가 (15)
 (19) (41) 가 ()

(CVD) 가 0.12 μm SiO₂ (12) , 가 1 μm SiON (13)
 , SiO₂ (12) SiON (13) . , SiON (13)

2 SiON (13) (16) 10 μm , , (3)
 (16) 30 (400) , (16)
 65) , ,

3 (17) (16) 가 0.2 μm
 (TiW) (18) (18) Cu 3 μm
 (19) (18) (19)
 (20) 2.3 μm

, H₂SO₄, H₂O₂, H₂O 1 : 1 : 2 , (20)
 (19) , H₂O₂, H₂O 1 : 2 ,
 (20) (18) , (20)

4 (19) TiW (28) 0.2 μ m (19) , TiW (28) ,
 , TiW (19) (18) (29)(5) (29) TiW
 , 1 LSI , IC (die sorti
 ng test) LSI
 , 5 LSI (19) Pb - Sn ((24) , 340 365 10 20 Pb - Sn ((24) , 18a (18)
 TiW (19) (18) Sn (19) 가 (19) (18)
 150 μ m . 5 29a (19) , 18a (18)
 , (19) (24) LSI () , LSI
 , (external terminal ball)() (heat sink)()
 6 4 (15) A가 140 \pm 10 μ m (19)((18)) 8 ,
 . 2 (5 29a) B가 135 \pm 10 μ m (17)(3) 8 ,
 , (17) (18) (5 18a) D가 90 \pm 10 μ m .
 , B D ,
 , A LSI (19) (17) , D
 , (19) (17) 8
 , (29) , Pb - Sn (19) (18)
 가 (24) Sn (19) (18)
 , (19) (18) 가
 (19) (29) Sn ,
 , (19) (29) 가 5 Sn

7 9 2 FCBGA ,
 , . 1 1 2 ,
 2 7 (17) (16) , TiW
 (18) 0.2 μ m , (18) Cu (20) 2.
 (19) 3 μ m 3 μ m .
 , H₂SO₄, H₂O₂, H₂O 1 : 1 : 2 , (20)
 (19) , H₂O₂, H₂O 1 : 2 , (20)
 (20) (18) , , (20) .
 (18), (19) (20) 1 3 .
 , 8 (19) TiW (21) 0.2 μ m
 , TiW (21) (25) 2.3 μ m , , ,
 (22A) (19) (22B) , TiW (21) .
 , (25) .
 , TiW (21) (21a)가 (19) , TiW (21)
 (19) (16) (21B) (step) . TiW (21) (19) (21A) ,
 , 1 LSI LSI (die sorting test) ,
 LSI .
 , 9 LSI (21a) (19) Pb - Sn
 (24) , 340 365 10 (19) . Pb - Sn
 TiW (21) (21) (19) 가
 , (19) Sn , (19) (19) (18)
 , (19) 150 μ m .
 10 8 , ,
 . LSI , 8 TiW (21), (15) 8
 (19) (15) A가 140 \pm 10 μ m, (21A) 2 B가 155
 \pm 10 μ m, (21a) 2 C가 135 \pm 10 μ m, (18a) 2 D
 가 90 \pm 10 μ m, (21B) 2 E가 165 \pm 10 μ m .
 , C D ,
 , A LSI (19) (17)(9) ,
 D (19) 가 , B E LSI
 (19) (25) , (19) (21)

(21) , D 8 , (19), (17)

(21a) (21) , Pb - Sn (19) (18)
 가 (24) Sn 가 (19) (18)

(19) 5 10(7) μ m 가, 9
 Sn (19) TiW (21) 가

11 17 3 FCBGA ,

11 (11) (15) ,
 가 0.12 μ m SiO₂ (12) , 가 1 μ m SiON (13) , CVD

12 (26) 2.3 μ m , , SiON
 (13) SiO₂ (12) (15) (17) , ,

(26)

13 (17) SiON (13) , TiW 0.2 μ m
 (18) 가 0.2 μ m TiW (21) (18) Cu 가 3 μ m (19)
 TiW (21) (15), SiO₂ (12) SiON (13) 가 (18), (19)

, TiW (21) (20) 2.3 μ m , H₂O₂, H₂O 1 : 2
 (20) TiW (21) , H₂SO₄, H
 2O₂, H₂O 1 : 1 : 2 (20) (20) (19)
 , H₂O₂, H₂O 1 : 2 (20) (20)

14 TiW (21) , (19), (18) SiON (13)
 (23) 10 μ m , (23)
 TiW (21) (23) (22) , (22)
 , 380 , 30

, H₂O₂, H₂O 1 : 2 (22) TiW (21) , 15
 (22) (21a) , (21a) (19)
 3) , (21a) TiW (21) (18) (22) (2) (2)

(23) (19) TiW (21) (23) (19)
 (19) (23) Sn (23) (19)

1 LSI (die sorting test)

16 (22, 21a) (19) Pb - Sn
 (24) , 340 365 10 Pb - Sn
 (19) (21, 23) Sn (19)
 150 μ m

17 15
 , TiW (21) (19)((18)) , 8 ()
 15) A가 140 \pm 10 μ m, TiW (21) 2 B가 155 \pm 10 μ m, (21a) 2
 C가 135 \pm 10 μ m, (18a) 2 D가 90 \pm 10 μ m

C D
 A LSI (19) (17)(12) D
 (23) 가 , B LSI (19)
 C (19)
 (17), (21) 8 (19),

19) (15) 가 18 ()
 , SiON (13) (19)

(21, 23) (24) Sn (19) (18)
 5 10 μ m 가, 16 가 (19)
 (18) () (23) Sn (19)

1 3 (15) 1
 (15) (11)
 (TiN), AlCu, Ti, TiN 가

(24) (19) , Sn
 , 1 3 (18)
 (19)

가

(19)

(die sorting test)

가

(57)

1.

2.

1

3.

1

(wettability)

4.

5.

1

TiW

6.

,
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,

,

,

,

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,

,

,

7.

6

,

8.

6

,

9.

6

,

Sn

,

Cu

,

Ti

10.

11.

6

,

TiW

12.

6 ,

TiW

13.

6 ,

SiO₂ , SiON

14.

15.

16.

17.

18.

19.

20.

21.

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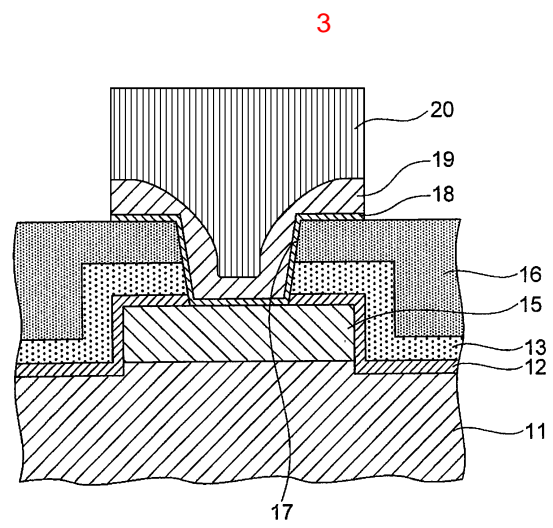
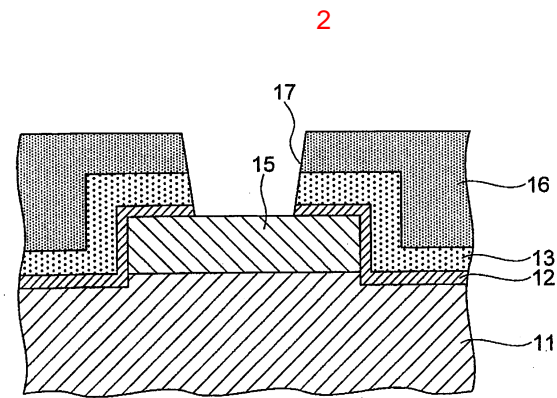
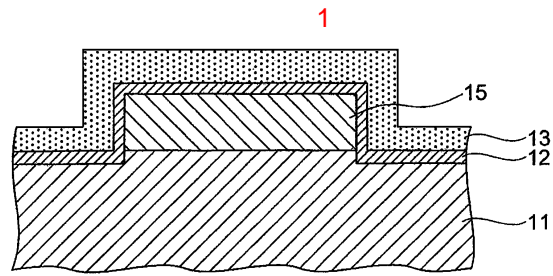
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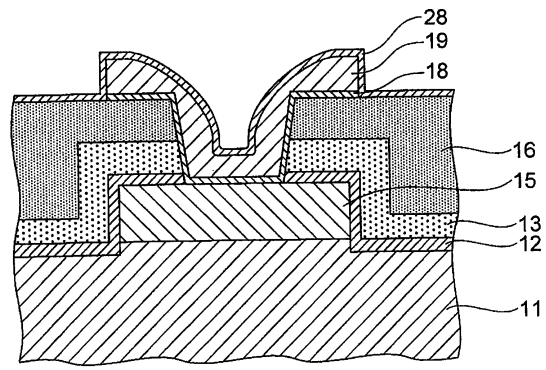
21

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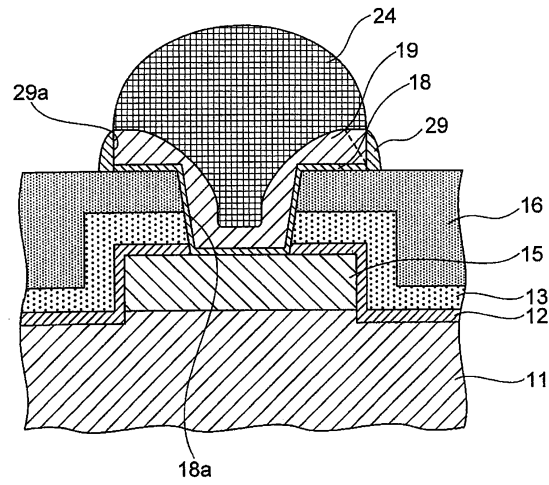
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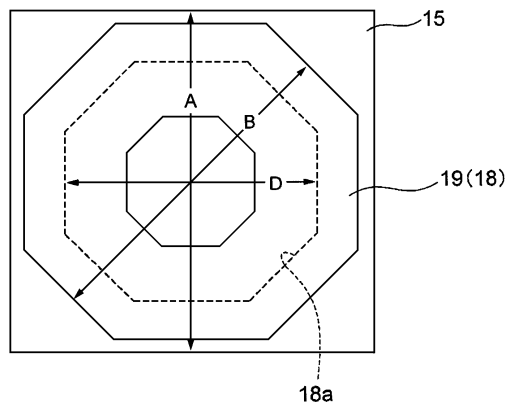
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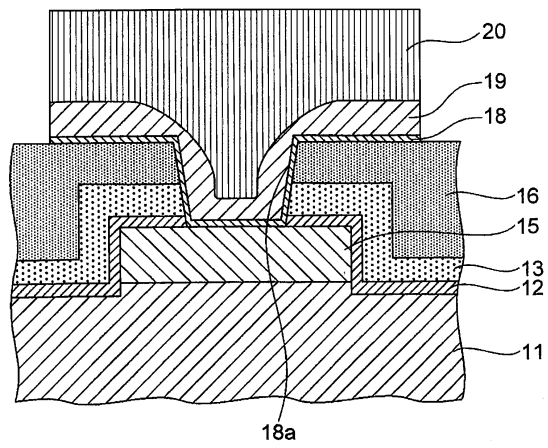
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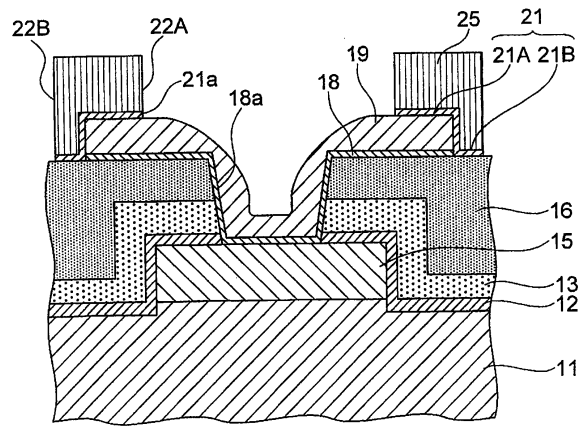
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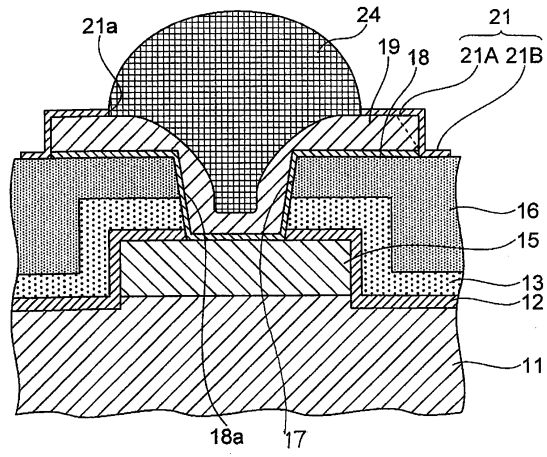
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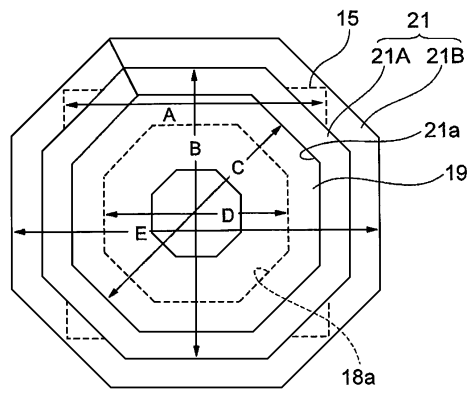
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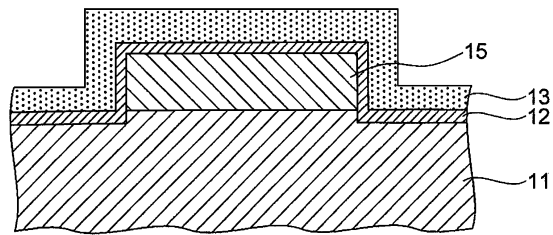
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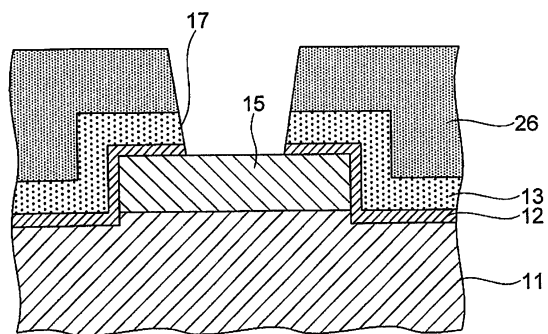
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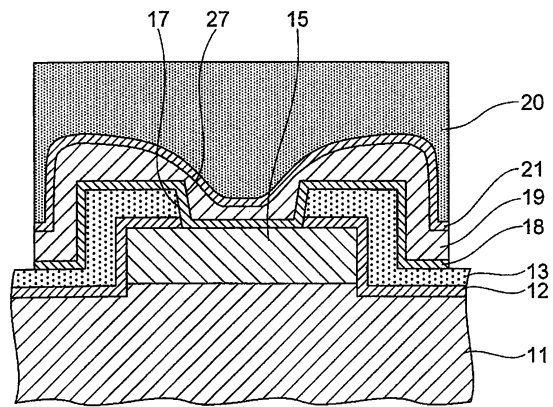
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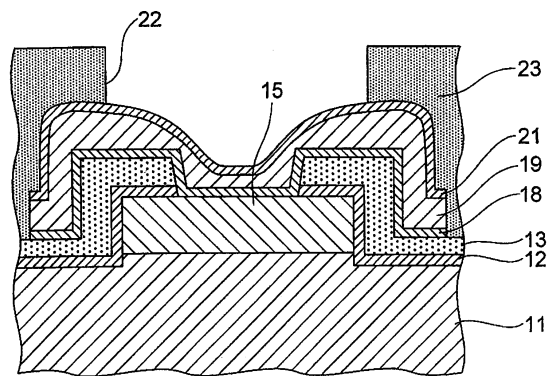
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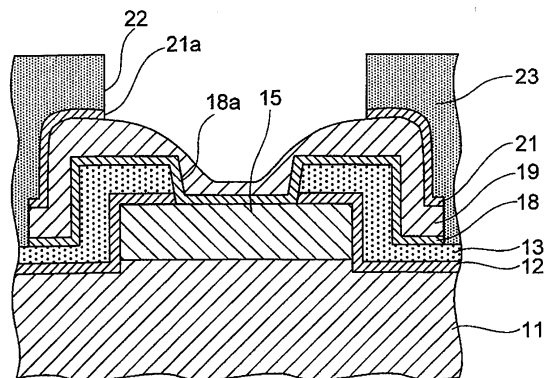
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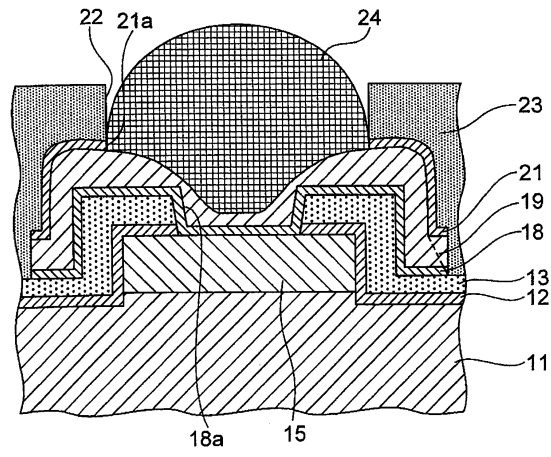
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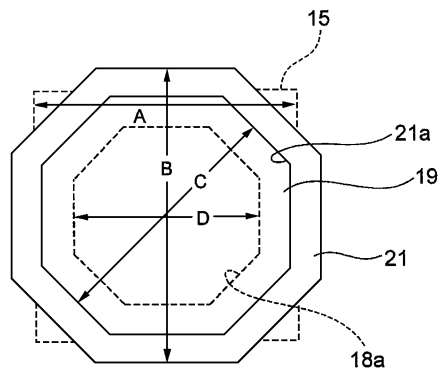
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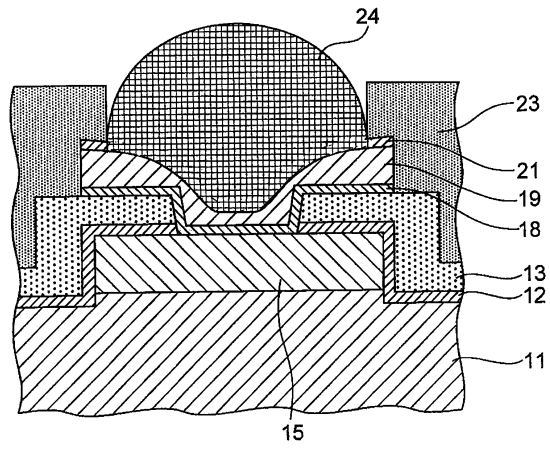
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17

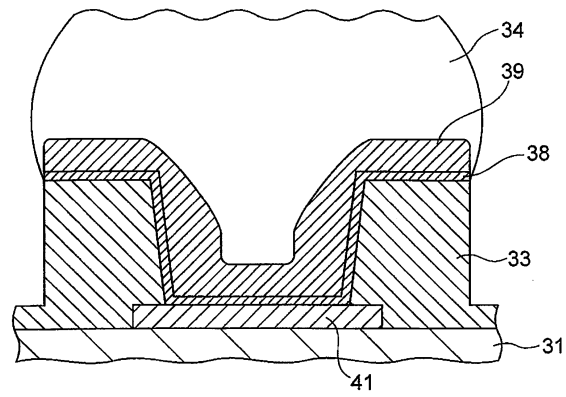


18



19

중래기술



20

종래기술

