

- 11. , 12. ,
- 13. 1 , 13a. ,
- 14. , 15. 2 ,
- 16. , 17. ,
- 18. .

(實裝) 가 . 가 ,

가 , 가 () , BGA
(flip chip) (face-down)

4(1992)-352429 ,

1a 1d (1) Al (2) (1) Al (2)

(3) (3) (4)

1b (1) Al (2) (直上部) , 1c Al

(2) (5) (5) (4), (3)

形) (5a) , (5) 1d (球

가 ,

(p.275)'

(Coffin-Mason) , 가

, ASIC(Application Specific Integrated Circuit) . 가

가 Al (5)(5a) 가

(Al (2),(2)) (5a) (5),(5) 가 (5a) (Al (2),(2))가

(5a) 40μm (5a) 70μm Al 가 (2),(2) 150μm

가 , 가 가 가

가 , 가 가 가

p.1575-1582 1987 12). (가(曾我) , (vol.J70-C, No.12p

Al AI

가 150μm

Al 100μm

가

가

가

1

가

가

가

2

1

1

1

1

2

2

2

4

5

3

2

6

가

가

가

가

가

가

가

가

가

가

가

가

가

2a

2a

10

11

(11)

(12)가

(

)

(11)

(12)

1

(13)

(11)

1

(13)

1

(13)

(12)

(11)

(12)

1

(13)

(14)

(12)

1

(13)

(14)가
가

Au/Cu/Ti

15)

1

(14)

(13)

가

(13)

2

(15)

2

(14)

(

2

(15)

(16)

(14)

(14)

(17)

(16)가
(18)가

(17)

(18)

, Cu, Au

Cu (18) (18) (共晶) (11) Ni,
 (18) 2b (11) 3
 (18) 1 (18) 2
 (18a) (11) (12) (12) (11) (14)
 (18b) (11) (12) (12) (11) (14)
 (11) (12) 2b (11) (14)
 (18) (18b) (12) (14)
 (18) 가
 2c 1 2c 2 (18)
 (10) (18) (12) (14)
 (18)가 (12)
 (11) 1 (13) (18)
 (11)가 (11) (12) (11) (12) (18)
 가 (10) (11) (12) (18)
 (12) (18a) 가 (12) (18b)
 1
 2b 2c (18) 1 2
 (18)
 (10) (12) 가 (11) 3a
 , Al (11) (12) 가
 (12) (12) 150 μ m (12) 가
 (11) (12) 3b 1 (13)
 1) 5 μ m (13) [: UR-3100((Toray))] (13a) (1)
 3b 2 (12) 100 2 (pre-baked) 1
 3c (14) 1 (13) (12) (13a) (11)
 [: OPR-800 ((東京應化))] 5 μ m 1 (13) 90
 (12) 가
 Ti, Cu, Au 0.1 μ m, 0.5 μ m, 0.1 μ m (14)
 (11)
 (14) 1 (13) 3d 2 (15)
 (15) [: UR-3100 ()] 1 (13)
 5 μ m 100 2 2 (1)
 5) μ m 가 (16) Cu, Au 3e
 2 (15) 1.0 μ m Cu, 0.1 μ m Au (17)

3f (15) (16) (17) (19) (17) (19a)
 2 (19) 2 [: PMER MR-19()] 40μm
 80μm (19) (16) (11) 4a (19a) (20)
 (21) (19) (19a) (20a) (5) (21) 3g (20)
 (19) (陽極)(22) (21) (22) (23) Pt/Ti (23)
 () 가 (24)가 (20) (20) (21)
 (11) (19) (5) (24) (11)
 (19) (17) 1.5A/dm² (17) (23)
 : LD-5 ((石原))](21) (20) (25) [(19) (19a), 2
 3 Pb : Sn=95 : 5 (17) 100μm (5)
 (15) (5) (11) (19) (17) (17)
 (19) (17) Au (NH₄I + I₂ + CH₃COOH) (17) Cu (N
 H₄OH + H₂O₂ + EDTA) (17) 2 (15) [: RH-518
 6 ()] 350 30 (18) (10)
 (5) 2a 100μm (18) 500μm 100
 μm 2b 2c (18) (12) (14) (18) (11)
 (18) (12) 가 (18) (18),(18)
 (18) (11) 가
 (11) 1 (13), 2 (15) , SiNx
 Ti/Cu/Au , Ti (13a, 16) Cr
 (14) 가 (14) 1 (13)
 1 (13) (12) (14)
 (14) (14)
 (20) (5) (14)
 (21) LD-5 (:) 40 가 (24)
 (17) (25) 1.0A/dm² (23) 50μm (24)
 (21) 0.1μm

, 가 , 가 , .

(57)

1.

, , 가 가 1 , , 가
1 , , , 가
2 , , 2 ,
2 2 , 2 ,
가 2 , 2 가
2 , , 가

2.

1 , 2 , , ,

3.

가 .
, 1 1 , 1
1 1 , 2
, 1 2 3 , 2
2 4 ,
5 , ,
6

4.

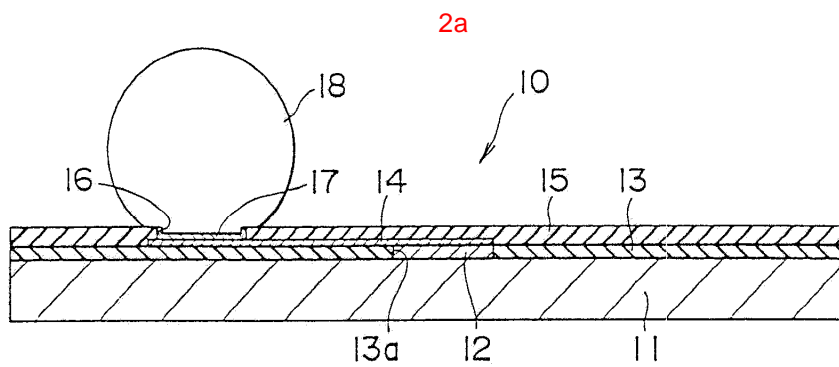
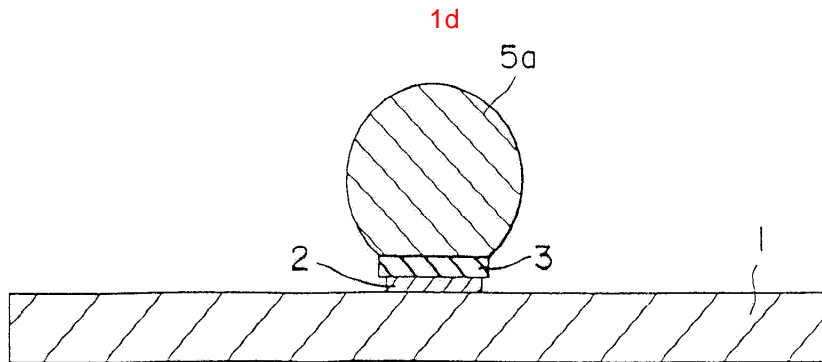
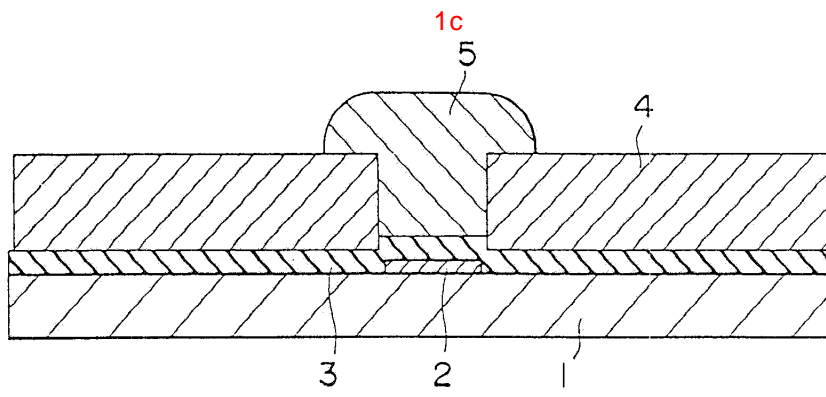
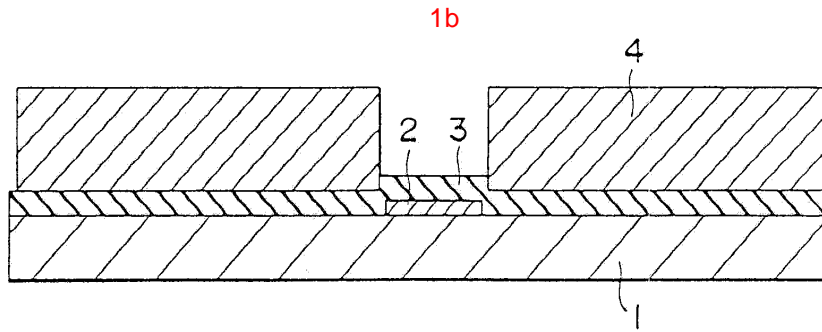
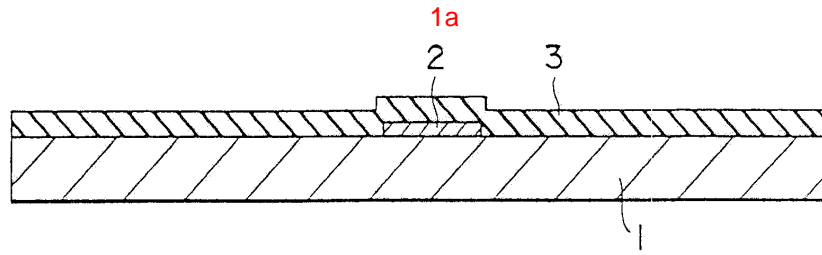
1 , 1 2 가
가 가 , 가 가 가
가 가 가 가

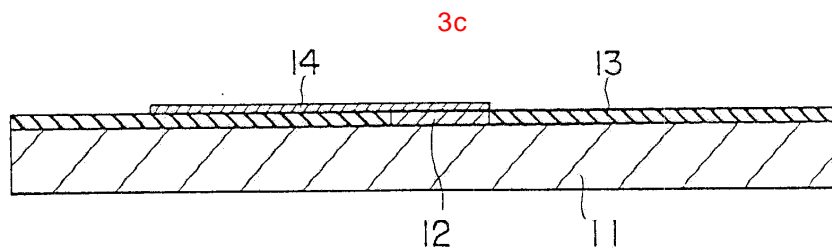
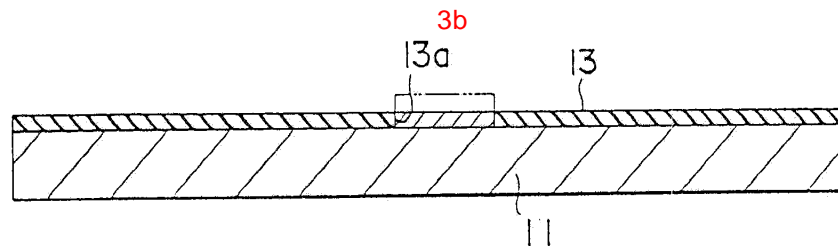
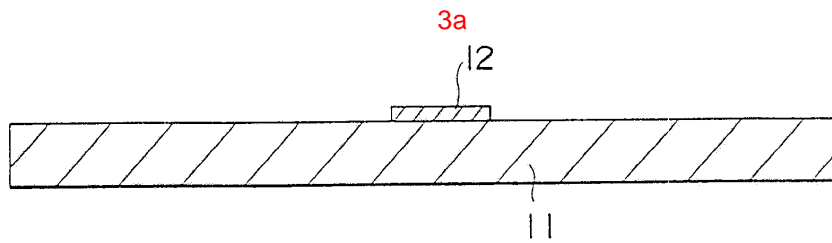
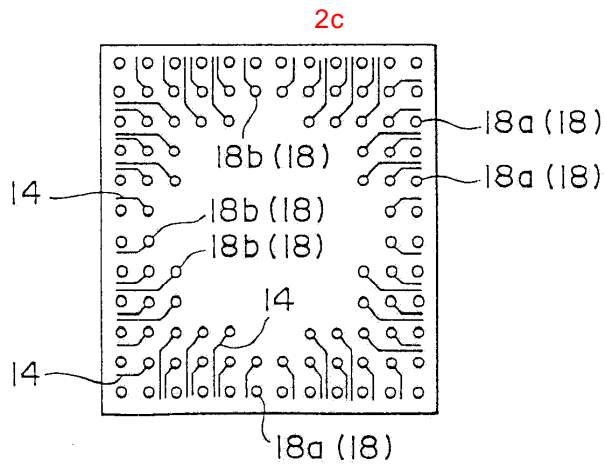
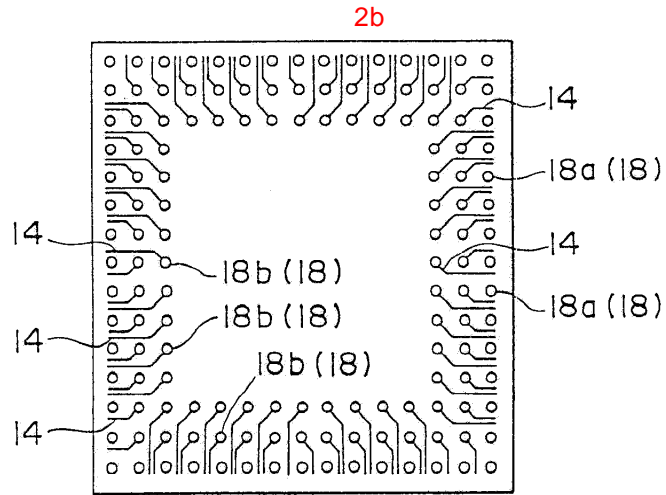
5.

1 , , ,

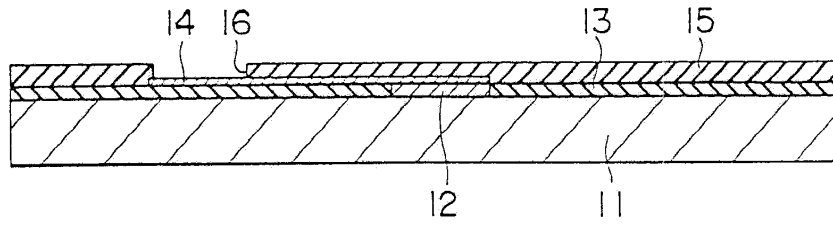
6.

5 , , ,

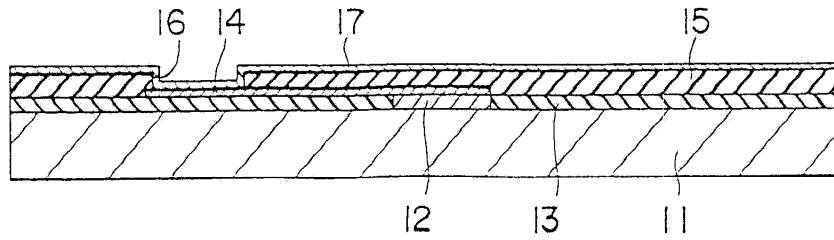




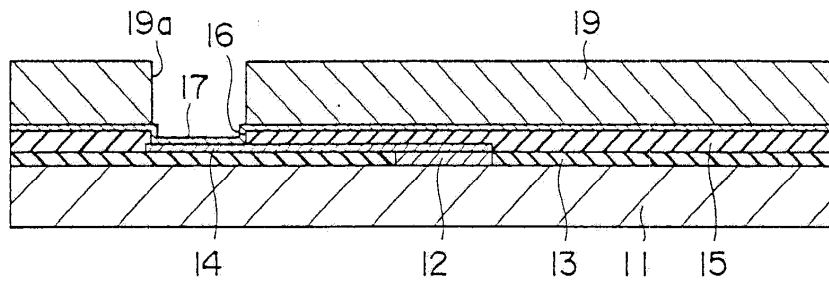
3d



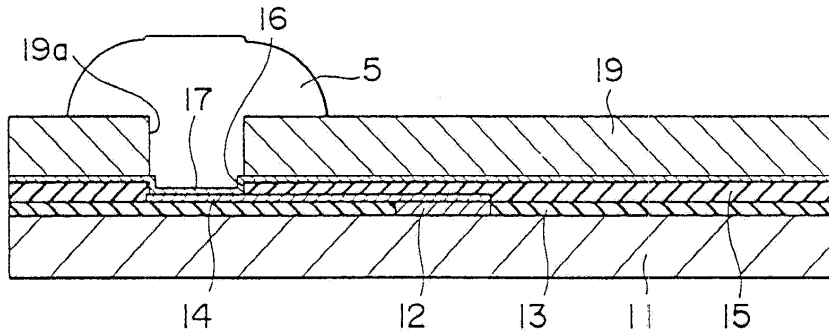
3e



3f



3g



4a

