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(81) : , , , , , , , 가 , , , ,
 , , , , , , , , , , , ,
AP ARIPO : , , , , , , , , ,
EA : , , , , , , , , ,
EP : , , , , , , , , , ,
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(72)	,		
	305		3 - 4 - 3 - 303
	,		
	305		3 - 4 - 3 - 304
	,		
	308		511 - 1
	,		
	316		4 - 3 - 2
	,		
	305		1 - 14 - 3
	,		
	316		4 - 46 - 24
	,		
	318		2565 - 17
가	,		
	352		5 - 5 - 8 - 303
가	,		
	244	가	가

(74)

:

(54)

1.5 % , 1.0 % , 3.0 % , 250
10 MPa ,

1

, , , , , ,

1 ,

2 ,

3 ,

1 :

4 :

6 :

7 :

9 :

가

Au - Si (共晶),

가

Au - Si

가

가 가
, IC, LSI

가

가 가

가
가

가

가

가 210 260
(,)

가

(1)

가

, (2)

가 , (4)

가

, (3)

가

가

가

,

가

)

가

1

(1)

(2)

[1(a)].

[1(b)]. (1) (熱盤)(7), 100 250 , 0.1 20 , (5) 4 200gf/mm² (6) (1) (8) (4)
]. 0.1 2 0.1 4gf/mm² 0.1 30gf/mm² 150 250 , 0.1 1.5 0.
 3 2gf/mm² 가 [1(c)
 9 [1(d)] [1(e)]

,
가
(自己 支持性)

,
1 ,
, 1.5 vol%

2 ,
, 1.0 vol%

3 ,
, 3.0 wt%

4 ,
, 250 10 MPa

5 ,
, 가 10%

6 ,
, 가 0.5 kgf/5 mm × 5 mm

7 ,
, 가

, 1.0 vol% 10 MPa , 3.0 wt% 250 , 가 .

1 1.5 vol%, , 2 1.
0 vol% , 4 250 10 MPa
6 ↗ 0.5kgf/5mm × 5mm

, 3 3.0 wt% 5 가
10%

IC, LSI, VLSI 가 가, 5mm
가 5mm , ,
- 3 , ,
3 (40) , (41) 3

, (1) (4)

가

1, 3 - () (), 1, 4 - () (), 1, 5 - (),
 1, 6 - () (), 1, 7 - () (), 1, 8 - () (), 1, 9 - () (), 1, 10 - () (), 1, 12 - () (), 1, 16 - (),
 , 1, 18 - () (), 2, 2', 3, 3' - , 2, 2 - (3, 4 -), 2, 2 - (2, 3 -), 1, 1 - (2, 3 -),
 , 1, 1 - (3, 4 -), 1, 2, 3, 4 - , 3, 4, 9, 10 - , 3, 4 - (3, 4 -), 1, 2, 5, 6 - , 2, 3, 6, 7 - - , 2, 6 -
 , 1, 2, 4, 5 - - , 1, 4, 5, 8 - - , 2, 7 - - 1, 4, 5, 8 - , 2, 3, 6, 7 - - , 2, 3, 3' -
 2, 3, 6, 7 - - 1, 4, 5, 8 - , 2, 3, 4, 5 - , 1, 8, 9, 10 - , 2, 3, 3' - , 2, 3, 5, 6 -
 , 2, 3, 5, 6 - , 2, 3, 4, 5 - , 1, 8, 9, 10 - , 2, 3, 2' - , 2, 3, 3' - , 2, 3, 3' -
 4' - , 3, 4 - (3, 4 -) , 1, 4 - (3, 4 -) , 1, 2, 3, 4 - , 1, 2, 3, 4 - , 1, 2, 3, 4 -
 3 - (3, 4 -) - 1, 1, 3, 3 - , 1, 2, 3, 4 - , 1, 2, 3, 4 - , 1, 2, 3, 4 - , 1, 2, 3, 4 -
 , 4, 8 - - 1, 2, 3, 5, 6, 7 - - 1, 2, 5, 6 - , 1, 2, 3, 4 - , 1, 2, 3, 4 -
 - 1, 2, 3, 4 - , 2, 3, 4, 5 - , 2, 3, 4, 5 - , 1, 2, 3, 4 - , 1, 2, 3, 4 -
 2, 2, 2) - - 7 - - 2, 3, 5, 6 - , 2, 2 - [4 - (3, 4 -)] , 2, 2 - (3, 4 -) , 4, 4' - (3, 4 -)
 , 2, 2 - , 1, 4 - (2 -) , 1, 4 - (2 -) , 5 - (2, 5 -) , 5 - (2, 5 -)
 1, 3 - (2 -) , 1, 2 - , 2, 3, 4, 5 - , 2, 3, 4, 5 - , 2, 3, 4, 5 - , 2, 3, 4, 5 -
 - 3 - - 3 - , 2

, 0 - , m - , p - , 3, 3' -
 , 3, 4' - , 4, 4' - , (4 - - 3, 5 -) , (4 - - 3, 5 -
 4' - , 4, 4' - , (4 - - 3, 5 -) , (4 - - 3, 5 -
 -) , 3, 3' - , 3, 4' - , 4, 4' - , 3, 3' -
 , 3, 3' - , 3, 4' - , 4, 4' - , 3, 3' -
 , 3, 3' - , 3, 4' - , 4, 4' - , 3, 3' -
 - , 4, 4' - , 2, 2 - (3 -) , 2, 2 - (3, 4' -)
 , 2, 2 - (4 -) , 2, 2 - (3 -) , 2, 2 - (3, 4' -)
) , 2, 2 - (4 -) , 1, 3 - (3 -) , 1, 4
 - (3 -) , 1, 4 - (4 -) , 3, 3' - (1, 4 - (1 -))
 , 3, 4' - (1, 4 - (1 -)) , 4, 4' - (1, 4 - (1 -))
 , 2, 2 - (4 - (3 -)) , 2, 2 - (4 - (4 -)) , 2, 2 - (4 - (4 -))
 3 -)) , 2, 2 - (4 - (4 -)) , (4 - (3 -)) , (4 - (4 -))
 (3 -)) , (4 - (4 -)) , 1, 2 - , 1, 3 - , 1, 4 -
 (4 - (4 -)) , 1, 2 - , 1, 3 - , 1, 4 -

, 1, 5 - , 1, 6 - , 1, 7 - , 1, 8 - , 1, 9 - , 1,
10 - , 1, 11 - , 1, 12 - , 2

(脱水閉環) 120 250

，
，
，
，

0.1 30gf/mm²가 , 150 250 , 0.1 2 , 0.1 4gf/mm² . 150 250 . 0.1 1.5 . 0.3 2gf/mm² 가 .

2 , 0.1 4gf/mm² 250 10 MPa , (, 150 250 , 0.1) .

1

(OPP :) , 가 ,
 1 , .
 , 1 160 가 ,
 , 300 , 12.5 gf/mm², 5 , ,
 (CEL - 9000) , [QFP (Quad
 Flat Package) 14mm x 20mm x 1.4mm, 8 x 10mm, 42].

85 , 85% RH 168 , IR (爐) 240
10 가 .

, , (%) 가 .
(/) × 100 = (%)

가 1 .

[1]

no.						Ag (wt%)	(%)	(%)
	A	B	C	D	E			
1234567						80808052600	2.01.91.81.51.2	100100100000
8910	E	F	F	F	F	6004080	1.00.90.80.70.4	0000
							1.7	100

(, .)

50mm × 50mm , 120 , 3 (desiccato)
r) (放冷) , M1 24 , M2

[(M2 - M1)/(M1/d)] × 100 = (vol%)

, d , .

< 2

2 100g 10g , 280g ,

(OPP :) 가 .
2 ,

, 2 , 160 가 .
, No.1 6 , 300 , 12.5 gf/mm², 5 , No.7 10 ,
230 , 0.6 gf/mm², 1 , (CEL - 9000) , (QFP) 14mm × 20mm × 1.4mm,
, 8mm × 10mm, 42).

85 , 85% RH 168 , IR 240 10
가 .

, (%) 가 .

$$(/) \times 100 = (%)$$

가 2 .

[2]

no.						Ag (wt%)	(%)	(%)
	A	B	C	D	D			
1234567						80808080604	1.71.51.41.00.80.	10010010000
8910	D	F	F	F	F	00605240	60.50.40.30.2	00000
							1.2	100

$$(, .)$$

100mm , , 120 3
M1 , , 85 , 85% RH
가 , M2 .

$$[(M2 - M1)/(M1/d)] \times 100 = (\text{vol}\%)$$

, d .

< 3

F 100g 10g , 140g, 140g
, 74g , , ,
120 (OPP : 3) , , 80 , 120
가 , OPP 80 , 30 , , OPP
, , , , , ,
(, 3 230 , 0.6 gf/mm², 1 CEL - 9000) , , (QFP
14mm × 20mm × 1.4mm, 8mm × 10mm, 42).

85 , 85% RH 160 가 , , 240 10
가 .

$$(/) \times 100 = (%)$$

가 3 .

[3]

no.	()	()	(wt%)		(%)
12345678 91011	80100100100100120120 140160140160	302410301075 10106030	6.54.94.23.83.53.02.2 2.01.51.20.7		100100100806 0000000
			15.0		100

(, .)

50mm x 50mm
200 2 가 , M2 , M1 ,

$$[(M2 - M1)/M1] \times 100 = \text{ (wt%)}$$

,
< 4
D 100g 10g , 140g, 140g
, 74g , ,
120 가 (OPP : 5) , 80
, 120 가 , OPP 80 30 , 가
,

, 4 160 가 ,
, 300 , 12.5 gf/mm², 5 , ,
(CEL - 9000) , , (QFP , 1
4mm x 20mm x 1.4mm, 8mm x 10mm, 42).

85 , 85% RH 168 , IR 240 10
가 .

,
(%) , 가
(/) x 100 = (%)

가 4

[4]

no.	()	()	(%)	(%)
1234567	80100100120120140160	3021010751030	30221710750	100100800000
			40	100

(, .)

= (%) , (軟) X

5

(OPP ;) , 가

, 5 , No.1 5 300 , 12.5 gf/mm², 5 , No.6 10 2
 30 , 0.6 gf/mm², 1 , , , , (, CEL - 9000) , (QFP 14mm × 20mm × 1.4mm,
 8mm × 10mm, 42).

85 , 85% RH 168 , IR 240 10
가 .

(%) , 가

$$(\quad / \quad) \times 100 = \quad (\%)$$

5

[5]

no.	Ag (wt%)					(kgf/5×5mm)	(%)
12345678910	B 80	C 80	A 80	D 80	0.20.30.40.50.70.81.	1001008000000000	
	F 80	F 0	F 30	F 20	01.5 2.0 2.0		
	F 40	F 52					

6

E 100g 10g , 280g . , ,

(OPP ;) , 가

, 6 , 300 , 12.5 gf/mm², 5 , CEL - 9000) , (QFP
 , (14mm x 20mm x 1.4mm, 8mm x 10mm, 42).

85 , 85% RH 168 , IR 240 10

, (%) , , 가 .

$$(\quad / \quad) \times 100 = (\%)$$

6

[6]

no.	mm × mm	mm ²	mm × mm	mm ²		(%)
1234567	11 × 1310 × 129 × 119 × 10	1431209990	8 × 108 × 108 × 108 × 108 × 10	808080808		100100100
8910111	8 × 118 × 108 × 97 × 108 × 9	8880727072	8 × 108 × 108 × 108 × 108 × 10	080808080		706000000
21314	6 × 85 × 74 × 63 × 52 × 4	483524158	8 × 108 × 108 × 108 × 10	808080808	0	0000

< 7

F 100g 10g , 280g . , ,

(OPP ;) , , 가

, 7 250 , 7 160 가 , , 7

[7]

no.	F F	AG (wt%)	(MPa)	(kgf/5mm × 5mm)	
				()	(gf/mm ²)
123	F	60400	1021	230230230	2.02.0.0.8

(MPa)

S , 5 /min, 10Hz , 250 E'

5

(57)

1.

2.

250 10 MPa , 1.0 %

3.

, , ,

250 10 MPa , , 3.0 %

4.

2 3 ,

力

5.

2 3 ,

6.

2 3 ,

(自己支持性)

7.

, , ,

250 10 MPa , , 1.5 %

8.

9.

, ,

, 250 10 MPa ,

, 1.0 %

10.

,
 , 250 10 MPa ,
 , 3.0 %

11.

9 10 ,
 , 100 250 , 0.1 20 , 0.1 30 gf/mm²

†

12.

9 10 ,
 , 100 250 , 0.1 20 , 0.1 30 gf/mm²

13.

9 10 ,
 , 100 250 , 0.1 20 , 0.1 30 gf/mm²

14.

9 10 ,
 , 100 250 , 0.1 20 , 0.1 30 gf/mm²

15.

9 10 ,
 , 1.5 %

16.

,
 ,
 , 100 250 , 0.1 20 , 0.1 30 gf/mm²

17.

18.

250 10 MPa , , 1.5 %

19.

250 10 MPa , , 1.0 %

20.

250 10 MPa , , 3.0 %

21.

18 20 ,

가

22.

,
 ,
 ,
 ,
 100 250 , 0.1 20 , 0.1 30 gf/mm² ,
 가

23.

22

250 10 MPa

24.

22

1.5 %

25.

22 ,

1.0 %

26.

22 ,

3.0 %

27.

18 20 22 ,

28.

18 20 22 ,

29.

,
,

3.0 % , , 1.0 %

30.

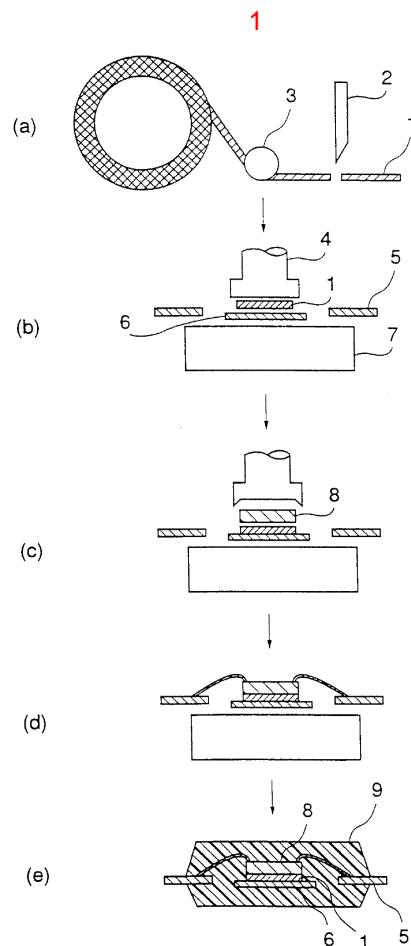
,
,

3.0 % , , 1.5 %

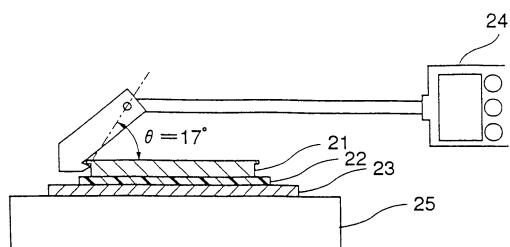
31.

29 30 ,

†



2



3

