

1 ,
2 ,
3 ,
4 ,
5 ,
6 (body) ,
7 ,
8 ,
9 ,
10 ,
11 ,
12 가 ,
13 .
< >

2, 12 : 3, 13: 4, 14 :
5, 15 : 6, 16 : 8, 18 :
10, 20, 30 : 17 : 31 :
32, 33, 34 : 36 : 37, 38 :
39 : 40 : 41 :
45, 46, 55, 56, 57 : 50,51,52,53 :
80,81,82,83,84,85,86 :
90,91,92,93 : p -
100,101,102,103 : n -

110, 112 : () 111 :

120,124,132,136 : n , n n -

122,126,130,134 : p , p p -

121,123,125,131,135 : 139 :

140 : 142 : 200 :

(recess) /

1 . 1 , ,
가 . 1 54.7 .

(thermopile)

, SiO₂, Si₃N₄

가

< 100>

, KOH EDP

111

54.7

, EP 1 039 280 A2 EP 1 045 23

2 A2, EP 0 599 364 B1, U.S. 3,801,949, U.S. 5,693,942, DE 42 21 037 A1 DE 197 10 946 A1

가

가 (sensitivity)

가

(recess)

/ (deep reactive i

on etching;DRIE)

40 °

가

(

가

80 ° ~ 100 °

(epoxide resin)

(

0.1 0.2mm) 가

45 °,

80 °

(passivation layer), Si_3N_4

가 90° 가 $80^\circ \sim 100^\circ$ 가 0.5 0.7mm

$70^\circ \sim 90^\circ$, $85^\circ \sim 90^\circ$
가

(thermopile)
(beam), p n- p n
(가) p n n
30% 80% 가

10% 15% p 가 n

CVD
(pyroelectric)

$2 \cdot 10^{-3} \text{ K}^{-1}$, $2 \cdot 10^{-2} \text{ K}^{-1}$
(bolometer) (meander layer)

(DRIE)

(Pits) RIE()
(inductive coupling) 가 가 ICP ()
) 가

() (, 가 SF6) ()
(passivation)
가 5,501,893

- " (through the wafer etching)" :

가 ()
200 - 800)

- 20% - 50% ()
(selectivity) (homogeneity)

- (passivation) " (re - entrant)"

가

- 가

() 1 가 (,)
가)가

- TMAHW(tetraammonium hydroxide in water)

가 , , , 가

1 (8) (2) 가
(3) (4) (8) (2) (6)
54.7 ° (5), (8) (3)

2 (10) (18) (12)

(18) (14) (18) (15) (13) (18)
 (18) (15) (13) (12) (16) 80° ~ 10
 0° (13) (15) 100° ~ 80°

3 2 (10) (30) 2
 (18) (15) (13) 80° ~ 89°
 (12) (16) (13) (17) (18)
 (13)
 (12)가

2 3 (10), (20) (13) , SiO₂ Si₃N₄, SiC
 (DRIE)

(10), (20) (thermopiles) (14)
 n , p n p
 (10) / (20)가 (14)
 (roof electrode) (10) / (20)가 (bolometer)
 (14) (meander layer) 가

4 5 (20) (20) (10) 가
 4 (20) (31) (31) (31)
 TO-5 TO-18 (epoxide resin)
 (20) (31)

(32), (33), (34) (31) (32), (33) (38),
 (37) (20) (45), (46)
 (30) 가 (36) (31)
 (39) (34)

5 (20) (41)가 (41)
 (40) 가 (41)

6 (12) 18 90° 15

7 (12) (18) 가
 (12)가 (50), (51), (52), (53) (18) (55), (56), (57)
 (51), (52), (53)

8 . p , p p -
 (90), (91), (92), (93) n , n n - (1
 00), (101), (102), (103) (13) (90), (91), (92), (93), (100), (101),

(102), (103) (beams)(80), (81), (82), (83), (84), (85), (86)
 . 8 8 가 . 20 200 , 60 120
 (13) (90),(91), (92), (93), (100), (101), (102), (103)
 (80), (81), (82), (83), (84), (85), (86) 가 .

9 (13) (110), (112)
 11), , (110) n p , n p , n p -
 . (112) p n , p n , p n -
 . () . ()
 110), (111), (112) .

n p . n n
 10 . 120, 124, 132, 136 n , n n
 - . 122, 126, 130, 134 p , p
 p - 121, 123, 125, 131, 133, 135
 (120) (122), (122) (124), (124) (126), (130) (132), (132) (134), (1
 34) (136) . (126) (136) (139)
 (120), (122), (124), (126), (136), (134), (132), (130)
 , 8 (120) - (126) (130) - (136)

11 (13)
 (140) (142) (140) (142)

12 . 12 3 (200)
 13 (10), (20) . 1 (70) (13)
 (12)

(71)
 (16), (12) (16)

(72) (14) (13)

(73)

(73) (72)

) (24) . DE 4221037 A1 " Thermal sensor having an absor
 ber layer" 가 .

가

가

(57)

1.

(15)

(14)

(18)

(10,20)

(13)

/

(15)

80° ~ 100°

2.

/

(10,20)

가

3.

2

40°

4.

3

(15)

80° ~ 100°

5.

2

가

가

8

0° ~ 100°

6.

80°

7.

6 ,

90°

8.

80° ~ 100°

9.

10.

(14)

가

11.

10 ,

가

p

n

p

n

12.

10 Ehh

11

,

가

p

n

13.

10

11

,

가,

p

n

14.

1

9

,

15.

1 9 ,

16.

17.

16 ,
(18)가

18.

19.

11 - 13, 16, 17 , (13) / 가
(14) (10,20) ,

가 p , - n ,

20.

19 ,
가 p , - n ,

21.

19 20 ,
가 20 200, 60 120 , p ,
- n ,

22.

20 21 ,

가, n , p , -

23.

22 ,

가, p , - n

24.

1 17 19 23 (10,20) 18 ,
(14)

25.

26.

25 ,

가

27.

25 26 ,

28.

가 , 1 17 24 , , ,
/ / / ,

29.

28 ,

/ / $80^\circ \sim 90^\circ$ () / / .

30.

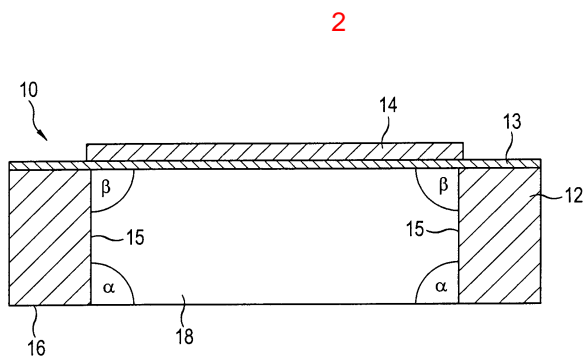
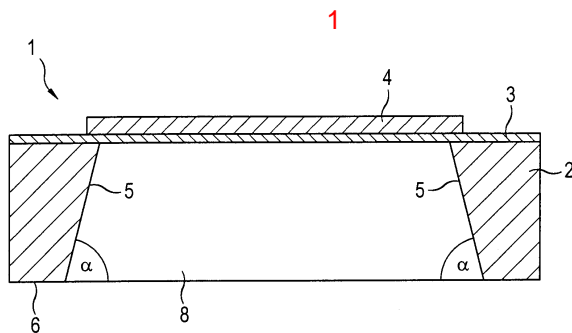
29 ,

/ / $85^\circ \sim 90^\circ$ () / / .

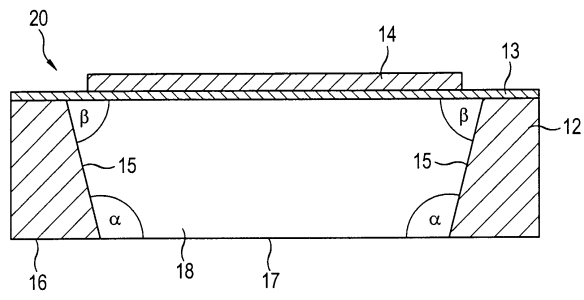
31.

25 30 ,

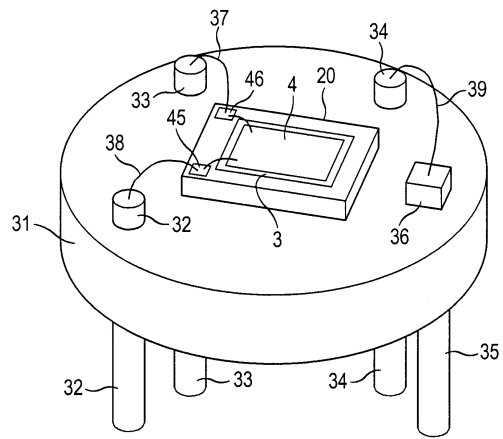
가



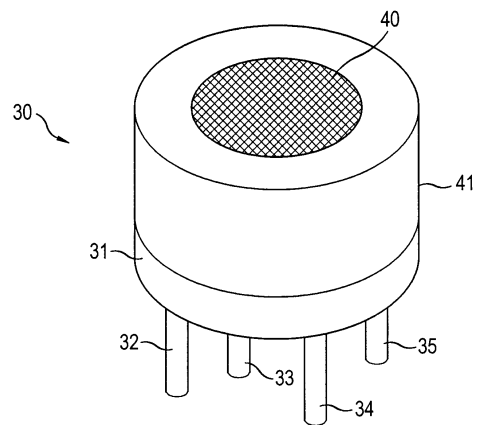
3



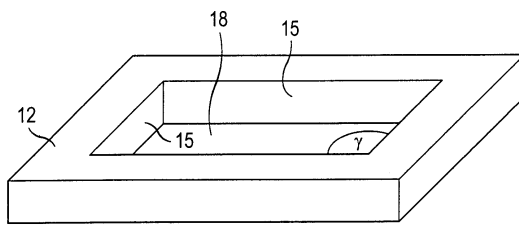
4



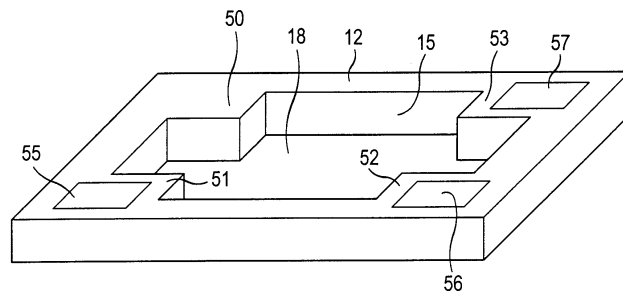
5



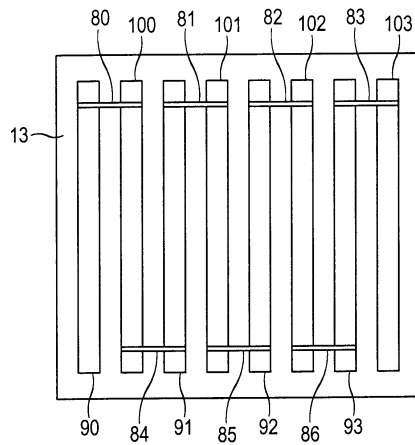
6



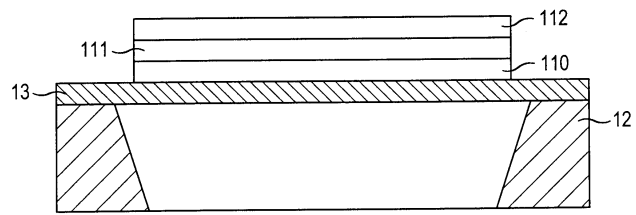
7



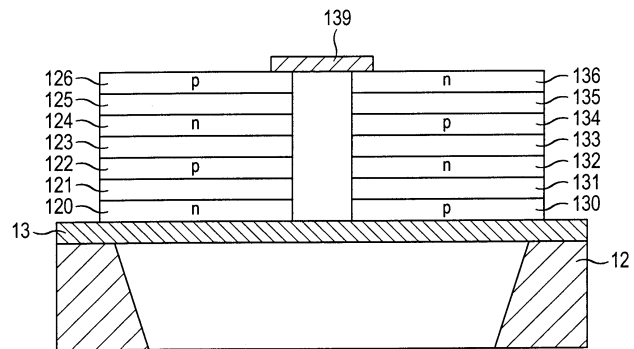
8



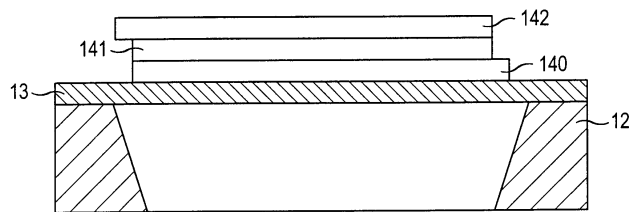
9



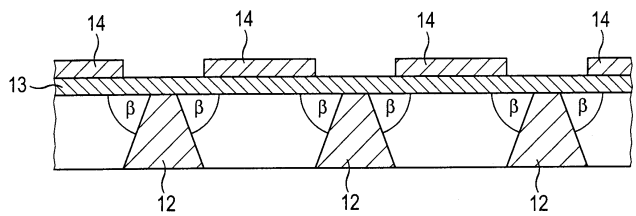
10



11



12



13

