

(19)  
(12)

(KR)  
(B1)

(51) 。 Int. Cl.<sup>6</sup>  
H01L 21/28

(45)  
(11)  
(24)

2004 06 23  
10-0424024  
2004 03 10

(21) 10-1996-0009023  
(22) 1996 03 29

(65)  
(43)

10-1996-0035841  
1996 10 28

(30) 08/413557 1995 03 30 (US)

(73) 80333 2

(72) , 12524 10

(74)

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(54) /

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1  
2 5  
6 가  
7 가 6  
8

\* \*  
13, 17, 21, 22, 33, 39, 80-88, 98, 112, 124, 126 :  
17, 19, 41, 43 : 42 : 2  
44 : 2 53, 90, 92, 96, 99 :  
20, 70-78, 110, 118, 122 :

heat resistance) (contact resistance) (s)

가 , 가

가 ,

(W) (Ti) (TiN) (via) (CVD)

(evaporation) , TiN CVD,

가 , 가 (Al)

(nodule) (hysteresis)

, Ti / TiN (SiO<sub>2</sub>)

, Ti / TiN

가 Al/ Al/W 가

(dual damascene)' (runner)'

1 , (24,26) (28)가 (SiO<sub>2</sub>) (16)

(24, 26) (14,15) (13,17)

(19,21)( (25) ) (14,15)

(24,26) (28) (20)

(22) (21) (20)

(12) (24,26) (28)

(12) (31) (31)

(19,17) (20)

1 가 (27,23,30,18) (29)

(31) /

가



4 TiN (35,37) (32,34) (51) 3 (51) Ti /  
 2 (33,39) (51) 1 (32,34) 가  
 (53) (51) (53) (51) (35,37) (42)  
 가 )가 가 (53) (51) (53) (53) (58,59,65)  
 5 (53) (53) (53) (70-78)  
 ( 가 (53) (70-78)  
 -88) (51) (80-88) Ti / TiN (70-78) (80-88) (51) (80-88)  
 (80-88) (70-78) (80-88) (53) (53)  
 (90) (80-89) (70-78) (53)  
 (90) (70-78) 가 (90)  
 (70-78) (90) (53) (80-88) (53) (90) (90)  
 (80-88) (53) (80-88) (67,68) (32,34) (90) (4) (67,68)  
 (53) (79,89) (90) (67,68) (90) (32,34) (67,68)  
 (90) (53) (32,34)  
 5 (CMP)  
 6 (38) (42) 2 (62) 6 (66) (64) (64) (53,90)  
 (78) (98), (88) (96,92)( (38) (51) (58,59)  
 (66) 가 / (41,43) (100) Al/Ti Al/TiN (100)  
 W/Al (103) (100) W/Ti W/TiN (53) (51) (58,59)  
 (70) , Ti TiN (66)  
 7 (42) (62) 6 (64)  
 (66) (L1) (L2) ( L1 L2 6 ) , L1 0.5  
 , L2 10 (64)가  
 (69) (51,53,90) (97), (69) 가 (91) (66)  
 (69,66) (69) (99) / (91)  
 (95)( ) (64) 97 51 (69) (91)  
 (95) (95) (92) (35,37)( 2 )  
 8 6 6 (66) 8  
 (120) 6 8  
 (35,37) (42) 8  
 (32,34) (35,37)  
 (115)( , Ti / TiN) 4 (53) (110,122,118)

(90) (114) (36) . Ti / TiN (112,124,126) , CMP (62)  
 4) , (109) (109) (120) (6)  
 (110) , W/Ti W/TiN (58,59) (41,43)  
 (109) , 8  
 ) ( )

(57)

1. 1 2 ;  
 1 2 (runner);  
 1 2 ;  
 1 1 ;  
 2 2 ;  
 1 1 2 ;
2. 1 1 2 ;
3. 1 1 2 ;
4. 2 1 2 ;
5. 1 1 1 3 ;  
 3 1 1 3 ;  
 1 2 4 ;  
 4 2 4 ;  
 3 4 ;
6. 1 1 2 가 ;
7. 1 1 2 ; 1 2 3 ; 2 2  
 1 1 2 ; 1 1 2 3 ; 2 2  
 1 2 ; 1 2 2 ; 3 1 3 ; 2  
 1 2 2 ; 1 2 2 ;
8. 7 ;
9. 7 ;  
 1 2 2 2 ;

1 1 1 3 ;  
2 2 2 ;  
3 1 3 ;

10.

7 , 2 ; 1 2 1 2  
2 , 2 , 1 1 2 1 2  
11. , 2 1 1 2

11.

10 , 1 2 , 1 1 1 2 3  
1 1 1 2 1 1 3 1 2 3  
2 1 1 1 3 1 1 1 2 1 ,  
1 1 1 2 1 1 1 1 1

12.

11 , 1

13.

12 , (runner) , 2  
3 3 ; 3  
3 4 ;  
4 4 ;  
3 , 4 4

14.

1 2 1 1 2 2  
; 1 2 1 1 ; 3 1  
; 1 2 1 ;  
1 2 2 ;  
2 2

15.

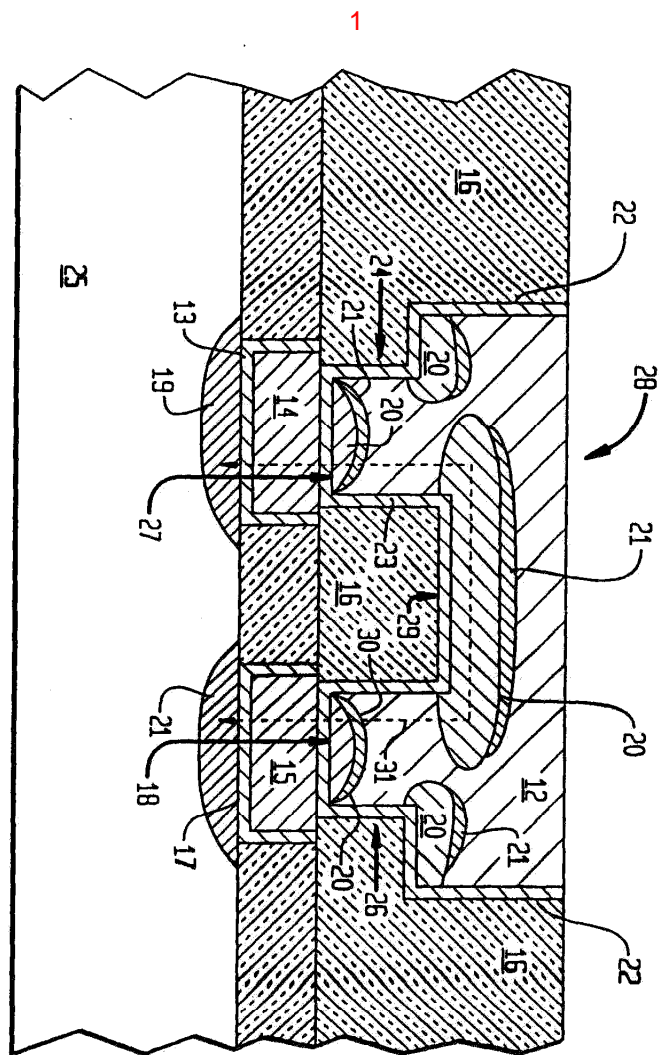
14 , 3 3 ; ;  
4 4 ; ;  
3 가 3 ;  
4 4 ;  
3 1 , 4  
2

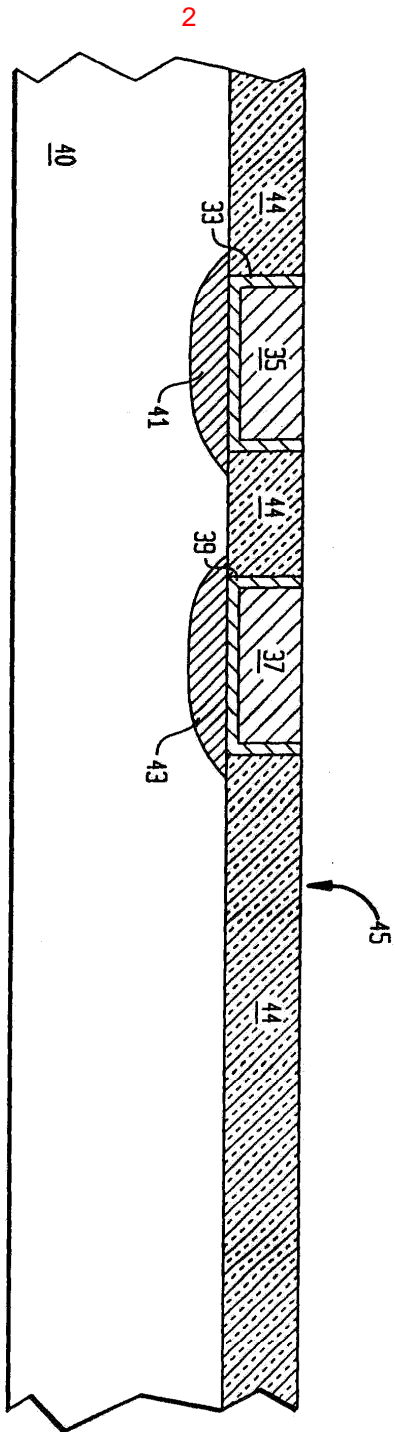
16.

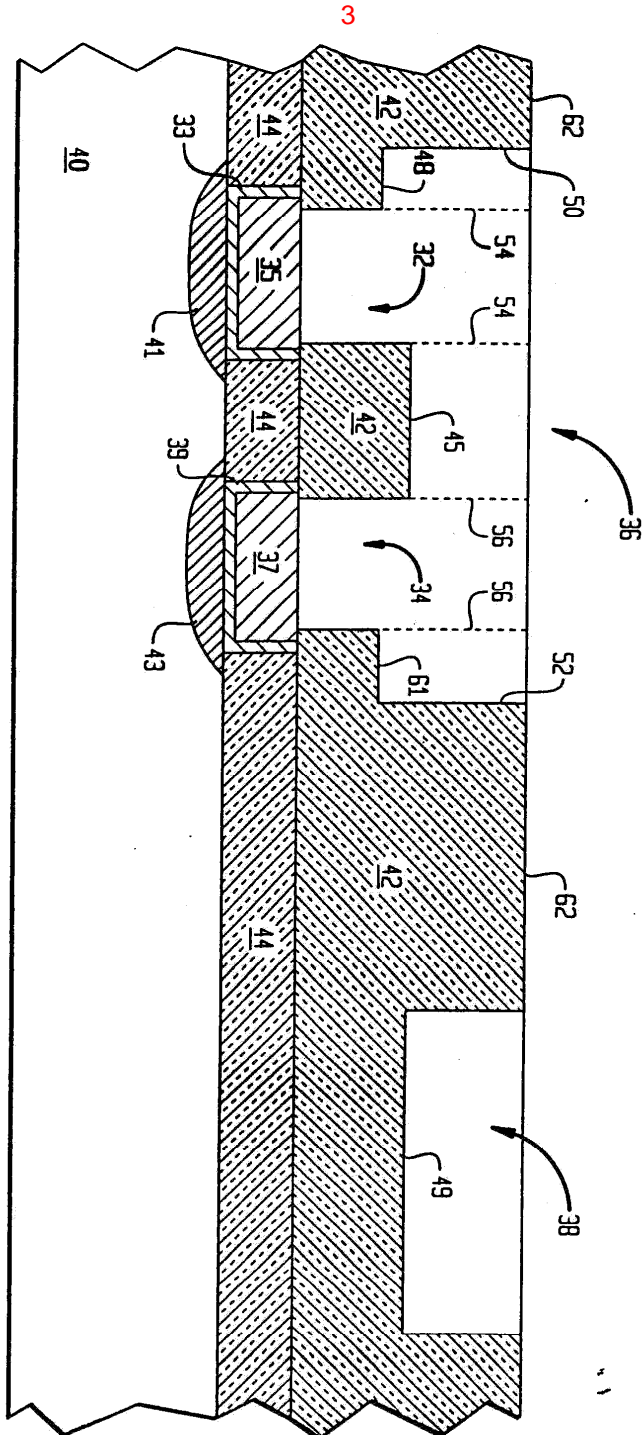
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1 2 2 , 1 2  
2 2 , 2 1 2  
2 2 , 2 2

17.

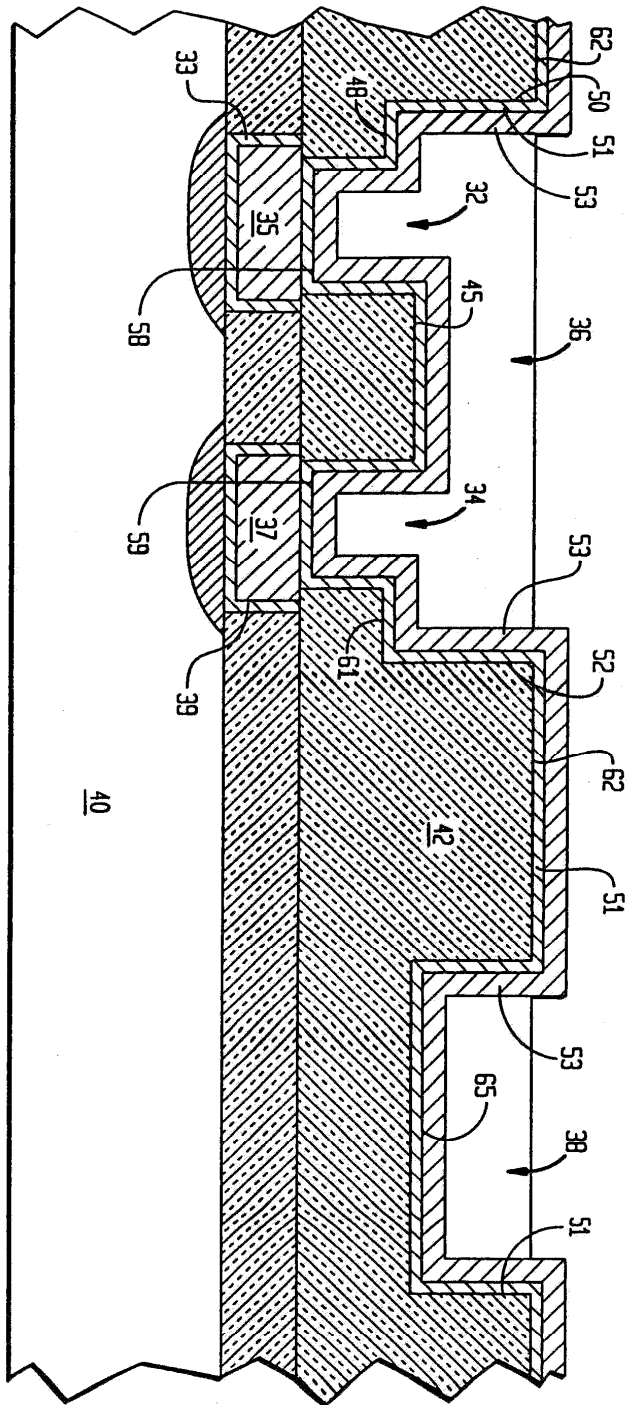
16	,	1	,	2	2	1
2		2		1		1 2
18.		1	2			
14		1	2			
14		1	2			
20.		1				
14		1				



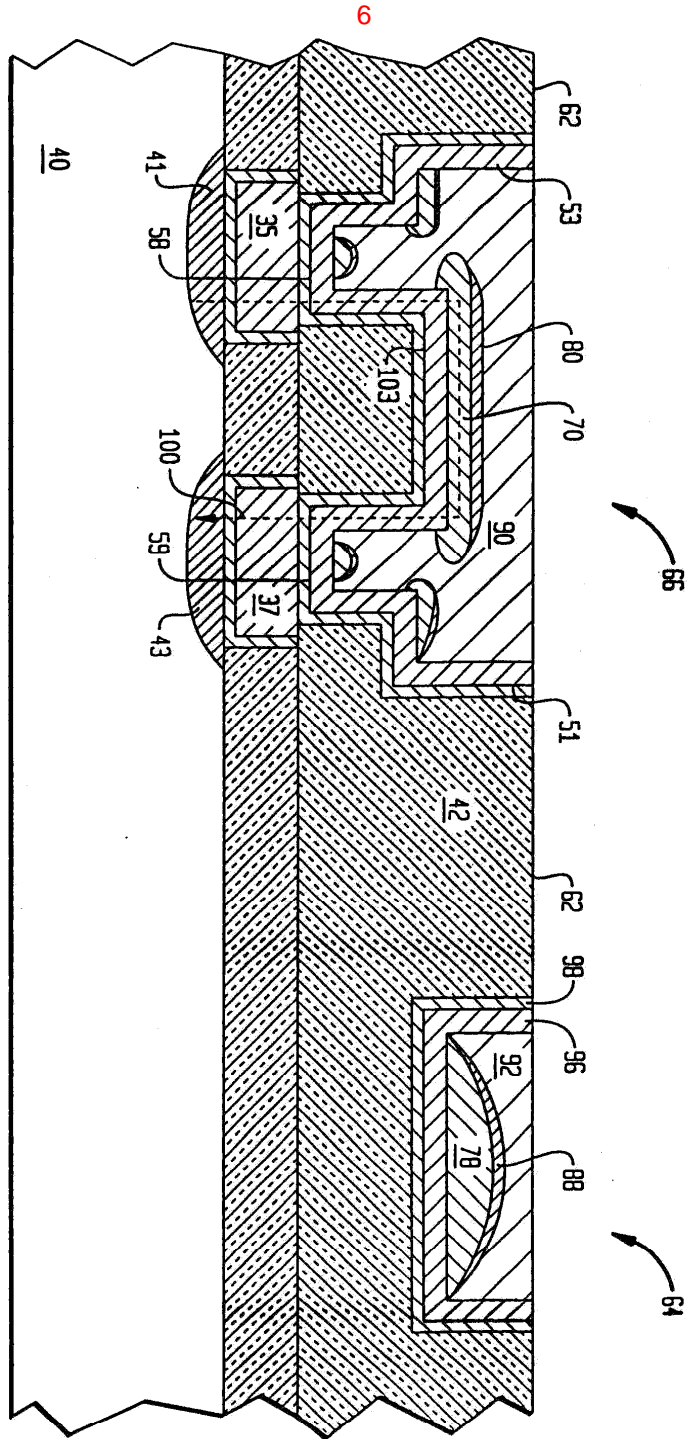




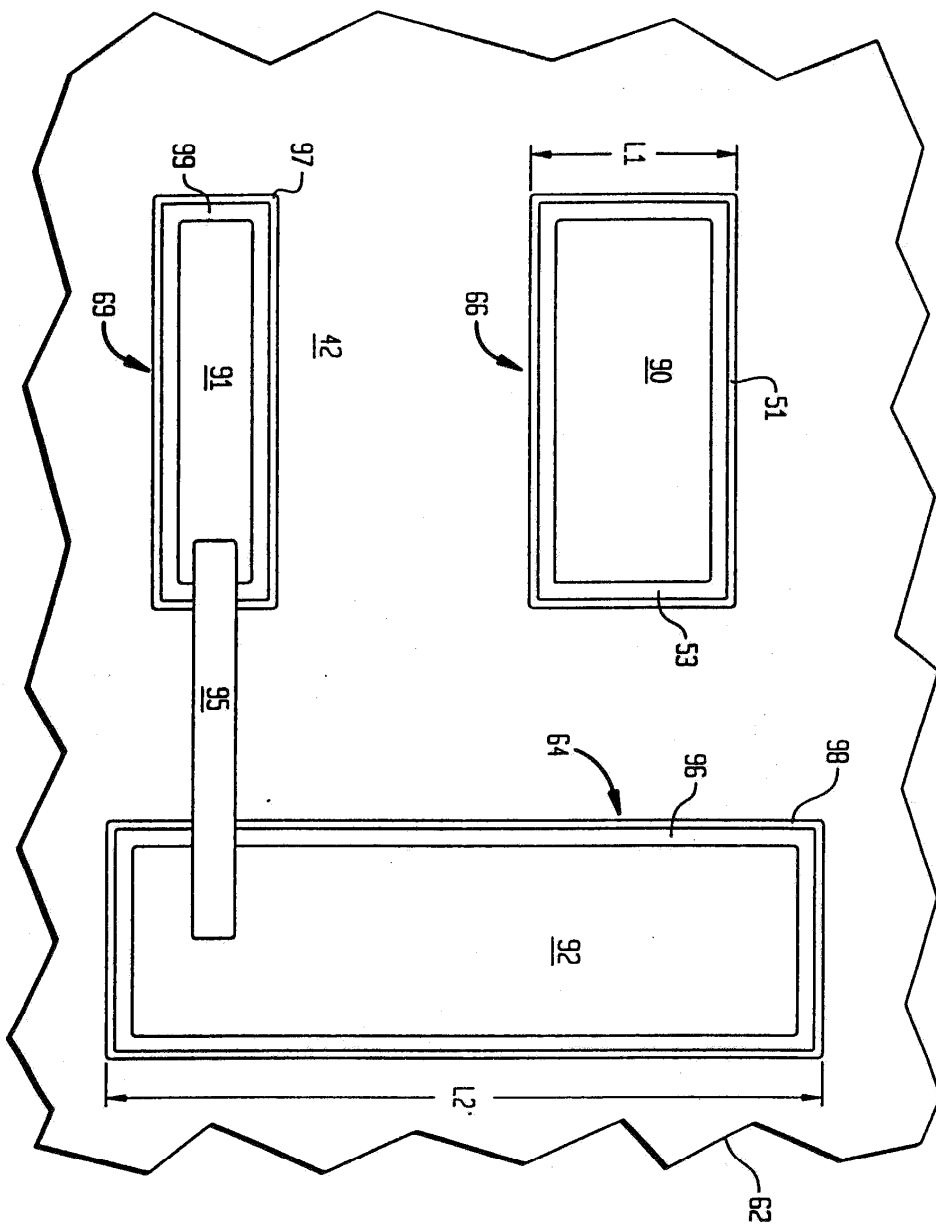
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