

(19)
(12)

(KR)
(A)

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H01L 27/108

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(43)

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2002 12 06

(21) 10 - 2001 - 0030529
(22) 2001 05 31

(71) 3 416

(72) 2 30 801
102 1004
530 LG 203 1302
11 1651 - 25 B01

(74)

:

(54) (M I M)

MIM

Pt, Ru Ir

(seam)

1 MIM (23) (15) TiN
 (13) (crack) , 1 MIM (23)
 (15) TiN (15) TiN 가 (15) TiN
 , (seam)

MIM

MIM

MIM

Pt, Ru Ir
 $Al_2O_3, Ta_2O_5, TiO, (Ba, Sr)TiO_3, Pb(Zr, Ti)O_3$ (Pb, La)(Zr, Ti)O₃

1

2

1

2

1

2

1

1

1

1

2

2

TiN
 (seam)
 (adhesion) (contact resistance)
 가 가 가
 " ()"
 3
 2 1 MIM
 (101), (101) (105)
 (103) (103) (10)
 5) (107) (107) (107) (105)
 (119a) (adhesion) (contact resistance)
 (107) TiN, TiSiN, TiAlN, TaN, TaSiN TaAlN
 (105) (119a)가 (119a)
 (119b) (119a) (119b)
 Pt, Ru, Ir (119b) (stack type)
 (105) (119a) TiN (119b) (seam)
 (113a) (103) (119b) (111a)
 (113a) (111a) (119b) (111a) (103)
 (119b) (121) (121) Al₂O₃, Ta₂O₅, TiO₂, (Ba, Sr)TiO₃
 iO₃, Pb(Zr,Ti)O₃ (Pb, La)(Zr, Ti)O₃ (121) (123)
 Pt, Ru Ir
 MIM (119b), (121) (123)
 (119a) MIM MIM (

(111)
(103)

(113)

(113)

(113)
(115)

(115)

6e
(109)
(115a),

2

(115),
(117)
(113a)

(113)
(111a)

(111)
(103)

1

5)

1

(105)
(109)
가
(115)
(107)

1

(109)

1

(105)

1

(103)
(109)
(105)

1

(105)

(111, 11
(103)

6f

1

(105)

2

(117)
(105)

1

(119a)

(seam)

Pt, Ru Ir

(119a)

6g
119a)

1

(105)

(119a)

2

(117)
(119b)

Pt, Ru Ir

(119b)

6h

(113a)

(115a)

(115a)

BOE(Buffered Oxide Etchant)

1)

2

(121)

Al_2O_3 , Ta_2O_5 , TiO_2 , (Ba, Sr) TiO_3 , $Pb(Zr, Ti)O_3$

(121)

(119b)

(123)

(101)

(Pb, La) $(Zr, Ti)O_3$

MIM

Pt, Ru I

r

7a

7c

3

7a

7c

2

6a

MIM
6h

3

1

(105)

2

(207)

2

1

(219b)

6a

6e
(107)

7a

(207)

1

(105)

7a

7c

7a , 1 (105) (207) (101)
 1 (105) (219) (219)
 (219) 1 (105) 2 (117) (115a)
 , 2 (117) (219)
 3) (219) (101) 2 (117) 2 (22)
 2 (223)

7b (115a) 2 (223)
 2 (117) 2 (223) (115a) (21
 9) 2 (223) , 1 (105)
 (219a)가 , 2 (117) (2
 19b)

7c 2 (117) 2 (223) , 2 (117) 2
 (111a) (115a) (115a) 2 (223)
 (223)

, 3 (219b) (101) (121)
 (123) MIM

8a 8f 4 3 MIM
 8a 8f , 6a 6h
 , 4 3 2 1
 1 (105) (207) 가 , (319a)
 (319b)

8a (101), (103) (10
 3) (103)
 1 (105)

, 1 (105) (101) (207) (20
 7) 1 (107) 1 (105) ,
 (103) (207) TiN , TiSiN , TiAlN , TaN , TaSiN TaAlN

, 1 (105) (101) (319)
 (319) Pt, Ru Ir

8b (319) (207) (103)
 (207) , 1 (105) (105)
 a)가 (207) (319a)가 (319

8c (319a), (207) (103) (111, lower mo
 ld layer), (113) (115) (111), (11
 3), (115) 6d

8d (115), (113) (111)
 (319a) (207) 2 (117) (10
 3) (115a), (113a) (111a)

8e (117) (319a)
 (319b)
 Pt, Ru Ir 1 (105) 2 (117) (319a)
 (319b)

8f 6h (113a) (115a)
 4 (319b) (101)
 (121) (123) MIM

9a 9c 5 4 MIM
 9a 9c 8a 8f
 4 4 3 3
 (419a)

8a 8d 9a 9c

9a (319a) (207) 2 (117)
 (101) (419) (219) 2 (117)
 (115a) 2 (117)
 (419) (101) 2 (117) (421)
 (421)

9b (115a) (421) 2
 (117) (421) (115a) (419)
 3 (421) (117)
 (419a)

9c 2 (117) (421)
 (113a) (115a) 2 (117) (421)
 (115a) (421)
 5 (419a) (101) (121) (12
 3) MIM

TiN

(seam)

(adhesion)

(contact resistance)

(57)

1.

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2.

1 , TiN , TiSiN , TiAlN , TaN , TaSiN TaAlN

3.

1 ,

4.

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5.

4 , Pt, Ru Ir

6.

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7.

1 , Al₂O₃, Ta₂O₅, TiO₂, (Ba, Sr)TiO₃, Pb(Zr,Ti)O₃ (Pb, La)(Zr, Ti)O₃

8.

1 ;

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2

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9.

8

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TiN , TiSiN , TiAlN , TaN , TaSiN TaAlN

10.

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11.

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13.

8

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14.

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2 ;

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15.

14 , 1 1

1 , , 1

16.

14 , TiN , TiSiN , TiAlN , TaN , TaSiN TaAlN

17.

14 , , ,

1 , 2 ,

18.

14 ,

19.

14 , 2

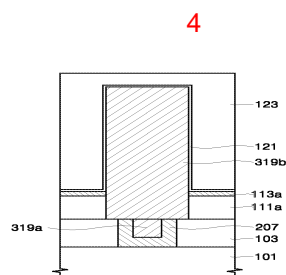
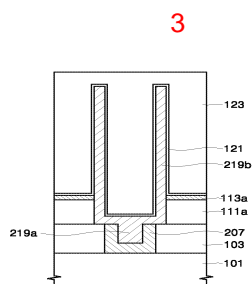
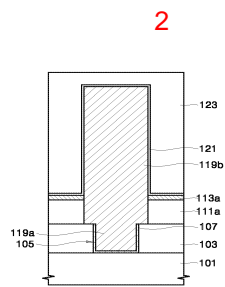
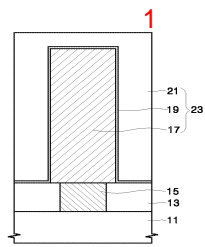
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14

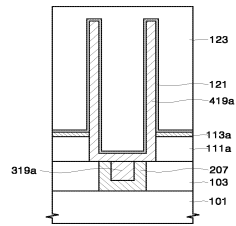
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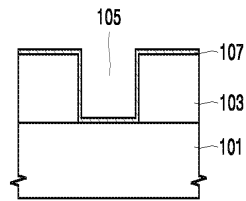
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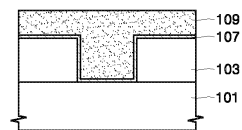
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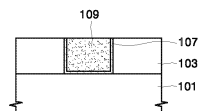
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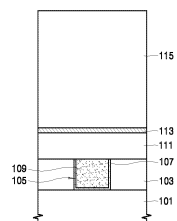
6b



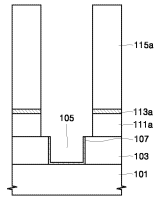
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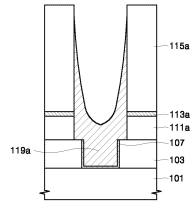
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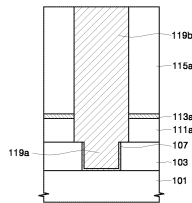
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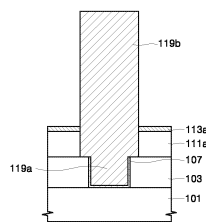
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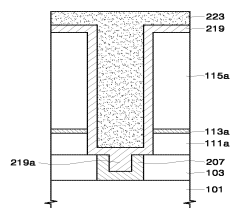
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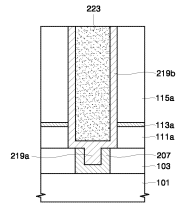
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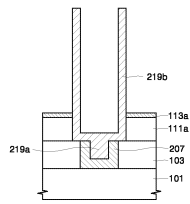
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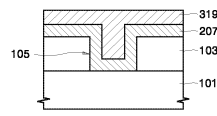
7b



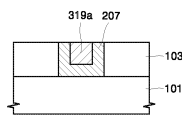
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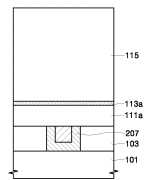
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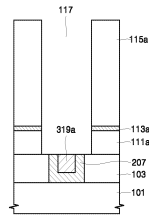
8b



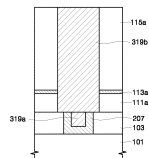
8c



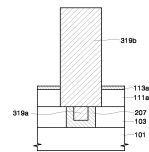
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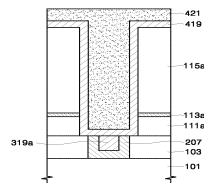
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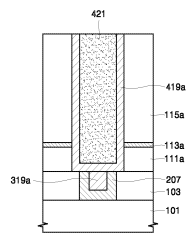
8f



9a



9b



9c

