

(19)
(12)

(KR)
(A)

(51) 。 Int. Cl. ⁷
H01L 21/8232

(11)
(43)

2002 - 0008535
2002 01 31

(21) 10 - 2000 - 0041873
(22) 2000 07 21

(71)

136 - 1

(72)

481 - 1 104 904

699 - 7 302 1911

(74)

:

(54)

Si_{1-x}Ge_x

GeO_x

Ge

1d

, Si_{1-x}Ge_x

1(a)

1(d)

< >

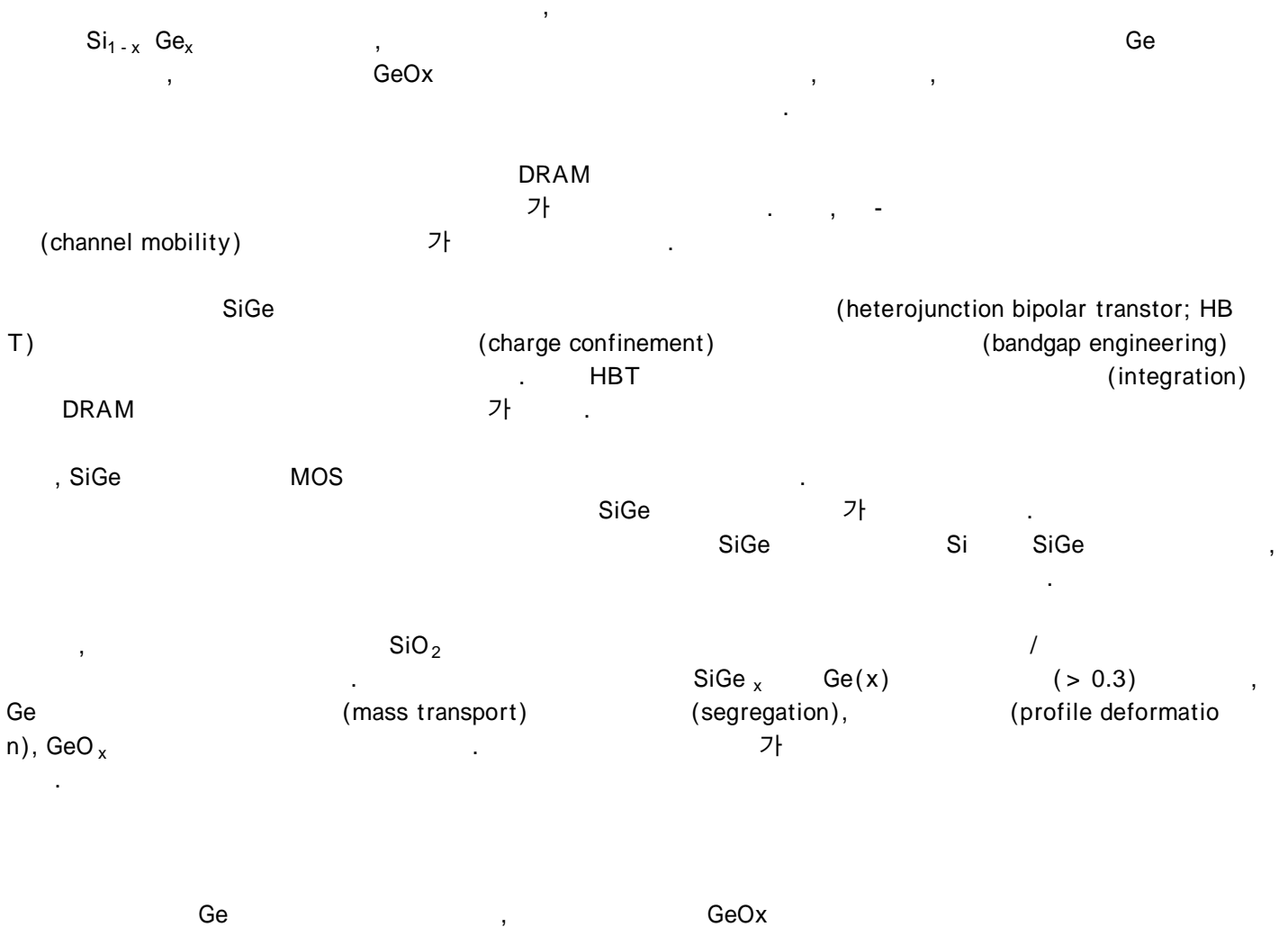
101 : 102 :

103 : 104 :

105 : 106 :

107 : 108 : $\text{Si}_{1-x}\text{Ge}_x$

109 : 110 :



Si Si_{1-x}Ge_x

(defect level)

8 10% , Ge 15 20% 20% Si_{0.8}Ge_{0.2} Si MOSFET 가 C

Si_{1-x}Ge_x

1(a) 1(d)

1(a) (101) (102) (102) LOCO (103) (104) S

(103) 650 950 (104) 20 80 700 3500

(105) (105)

SiO₂, SiON, Al₂O₃, SiC, AlN

(106) (106) 800

1000

(107)

(107) BPSG , HDP PSG , APL

1(b) (104) (103)

(101) 50 500

(104) NH₄OH:H₂O가 1:6 T

MAH[Tetra Methyl Ammonium Hydroxide; N(CH₃)₄OH]

(103) 50:1 HF

100:1 HF

(101)

1(c) , $\text{Si}_{1-x}\text{Ge}_x$ ($x=0.05$ 0.35) (108) 30 1000
 . $\text{Si}_{1-x}\text{Ge}_x$ (108) UHVCVD LPCVD . UHVCVD
 $\text{Si}_{1-x}\text{Ge}_x$ (108) 1E - 4 1E - 3Torr 500 700
 GeH_4 가 2 10sccm, Si_2H_6 가 2 10sccm, Cl_2 가 2sccm 10 3
 . , LPCVD $\text{Si}_{1-x}\text{Ge}_x$ (108) 10 100Torr 650 750
 GeH_4 가 100 500sccm, Si_2H_6 가 100 200sccm, HCl 가 100 150sccm
 20 10 . , $\text{Si}_{1-x}\text{Ge}_x$ (108) $\text{Si}_{1-x}\text{Ge}_x$ (108)
 Si 30 100 , UHU
 CVD LPCVD . UHVCVD Si 1E - 4 1E - 3Torr
 500 700 Si_2H_6 가 2 10sccm, Cl_2 가 2sccm 10 3
 . , LPCVD Si 10 100Torr 750 850
 Si_2H_6 가 100 200sccm, HCl 가 100 150sccm 20 10
 . , $\text{Si}_{1-x}\text{Ge}_x$ Si (multiple quantum well)
 . $\text{Si}_{1-x}\text{Ge}_x$ 10 50 , Si 10 50
 가 30 1000 .

1(d) , (109) (110) . (10
 9) SiO_2 , Al_2O_3 , Ta_2O_5 , ZrO_2 , HfO_2 La_2O_3 ,
 (109) 10 45 (effective thickne
 ss) . (110) , 300 2000
 . (109) (110) .
 ZrN , HfN , TiAlN , TaAlN , TiN , TaN , WN Ta , 50 1000
 . (110) (109) .

GeOx , Ge , $\text{Si}_{1-x}\text{Ge}_x$.

(57)

1.

2.

1. 20, 80, 650, 950
- 3.
4. 700, 3500
5. SiO₂, SiON, Al₂O₃, SiC, AlN
6. 800, 1000
7. BPSG, HDP PSG, APL
8. NH₄OH:H₂O가 1:6, TMAH[N(CH₃)₄OH]
9. 50:1 HF, 100:1 HF
10. 50, 500
- 11.
- 12.

1 , $Si_{1-x}Ge_x$ x 0.05 0.35 .

13.

1 , $Si_{1-x}Ge_x$ 30 1000 .

14.

1 , $Si_{1-x}Ge_x$ 1E - 4 1E - 3Torr 500 700
 GeH₄가 2 10sccm, Si₂H₆가 2 10sccm, Cl₂가 2sccm 10 3 U
 HUCVD .

15.

1 , $Si_{1-x}Ge_x$ 10 100Torr 650 750 GeH
 4가 100 500sccm, Si₂H₆가 100 200sccm, HCl 가 100 150sccm 20
 10 LPCVD .

16.

1 , $Si_{1-x}Ge_x$ Si .

17.

16 , Si 30 100 .

18.

16 , Si 1E - 4 1E - 3Torr 500 700 Si₂H₆
 가 2 10sccm, Cl₂가 2sccm 10 3 UHVCVD .

19.

16 , Si 10 100Torr 750 850 Si₂H₆가
 100 200sccm, HCl 가 100 150sccm 20 10 LPCVD .

20.

1 , $Si_{1-x}Ge_x$ $Si_{1-x}Ge_x$ Si .

21.

20 , $Si_{1-x}Ge_x$ 10 50 , Si 10 50
 가 30 1000 가 .

22.

1 , SiO_2 , Al_2O_3 , Ta_2O_5 , ZrO_2 , HfO_2 La_2O_3

23.

1 , 10 45

24.

1 , , 300
2000

25.

1 ,

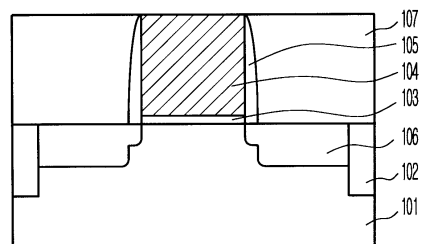
26.

25 , ZrN , HfN , TiAlN , TaAlN , TiN , TaN , WN Ta

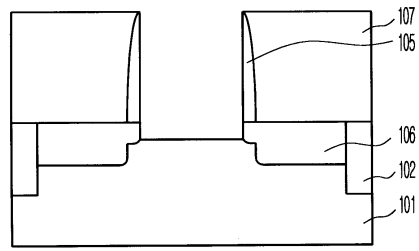
27.

25 , 50 1000

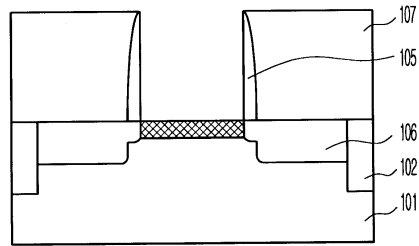
1a



1b



1c



1d

