

(19)  
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(KR)  
(B1)

(51) 。 Int. Cl. <sup>7</sup>  
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(24)

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2001 12 01

(21) 10 - 1998 - 0034975  
(22) 1998 08 27

(65) 1999 - 0023953  
(43) 1999 03 25

(30) 9 - 232578 1997 08 28 (JP)

(73) 가 가 가  
가

5 7 1

(72) 5 7-1 가 가

(74)

:

(54) ,

, ;

; , 가 .

가 2가 ,

9

1 1 ;

2a 2b - ;

3 1 ;

4 2 가 ;

5 가 ;

6 가 ;

7 가 ;

8 2 ;

9 1 ;

10 1 ;

11 ;

12 ;

13 1 ;

14 .

[ ]

2 - 4 :

5 - 7 :

12, 13 : -

15 : 가

37 : 가

40 :

61 :

62 :

64 :

65 : 1 2

66 :

67 :

68 :

71 :            101 :            CPU

103 :            ROM 104 :            RAM

105 :            HDD 106 :            FD

108 :            CD-ROM 113 :

Large Scale Integrated Circuits)    MMIC(Micro Monolithic Integrated Circuits)

, LSI(L

가

가

FF (flip - flops)

in) 가

(fan - out)

가

(fan -

1    3

3    2-

(1)  
(2    4)    3

1  
(5    7)

(1)

(3) (2) 1 (5) 2 (6) (3) ,  
 (3) 3 (7) (4) .  
 1 , " R1 - R3" (2 - 4)가 , " M1 - M3" (5 - 7) , "  
 C1 - C3" , " Cm1 - Cm3" .

1 , (1) , (2 - 4) - (1)  
 , 2 , " R(1), R(0)" (2 - 4)가 , " TEST" .

11) , (2 - 4) 3 - (12 - 14) , (1) (15) 가 (

(15) 가 , (15) .  
 - (12 - 14) 가 .  
 , - 가 (2 - 4) 가

3 , " R1, R2,..." , " M1, M2,..." , " C1, C2,..."  
 , " Cm1, Cm2,..." , " TEST" .  
 , " SCAN - IN (0), (1)" (1) , " SCAN - OUT (0), (1)"

(11) , - (12 - 14) .  
 , (1) (2 - 4) - (12 - 14) .

가 (" H - SCAN: A High - Level Alternative to Full Scan Testing with Reduced Area and Test Application Overheads" : 14th VLSI Test Symposium 1996, IEEE, pp.74 - 80)

2 , 1  
 (1) (2 - 4) - (12 - 14) ,  
 - (12 - 14) (2 - 4)

, (5 - 7) (3 4) (5 - 7)

2 (21) , 4 (22)가 ,  
 가 (22) , 5 (23 - 26)

(1) 가 . ,

(27 28) 가, 6 , (29) (27 28) 2  
 가 7 " C1"

(1) (31) , 8  
 (2 - 4) (5 - 7)

(31) , (32) 1 (2) 가  
 (33) (34 35)  
 2 (3) (5 6) 가 .

(36) 가 (37) 3 (4)  
 (7) 가 (15) 3 (4)  
 가 .

2 가 (31)  
 (1) (2 - 7)

(31) 1  
 (31)

(15) 가 " 4" , (1) 가 " 2" ,  
 (11) : (2 - 4)가 2  
 (1)

$(2 \times 3) \times 2 + (4 \times 2) = 20.$

가 (33 36) " 1" , AND (34 37)  
 " 2" , OR (35) " 2" , 2  
 (1) (31) :

$(4 \times 4) + (2 \times 1) + (2 \times 2) + (1 \times 2) = 24.$

1  
 2- 2 1- 2 , ,  
 1

2가

(11 31)  
가

가

1

가

가

1

1

2

1

2

가

가 가

가

가

가 가

가

가

가

가

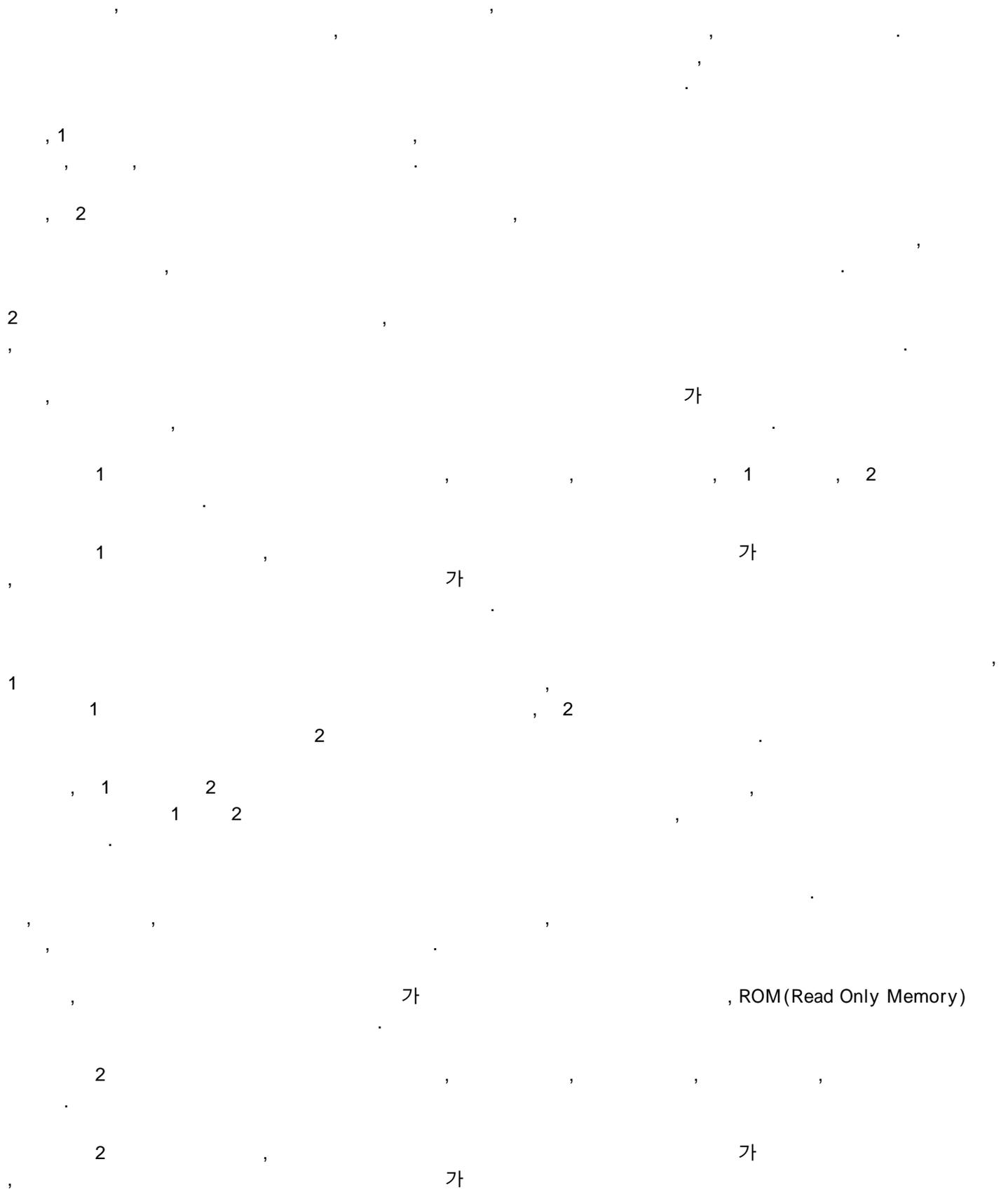
가

LSI MMIC

LSI

1

2



가

1 2

가

, 가

1

가

1

2

, 1  
2

2

1

가

ROM HDD(Hard Disc Drive),

가

CD - ROM(Compact Disc ROM)

ROM, RAM, I/F(interface)

가

CPU(central processing u

nit)

가

2

가

가

가

가

가

가

, FD

MO(magnetic optical disk)

가

가

가

2

1 9 13 .

(40) (41)

11 , (41) (44) (4

2) (43)

12 , (42) CPU(101) C

PU(101) (102) ROM(103), RAM(104), HDD(105), FD(106) FDD(107), CD - R

OM(108) CD (109), (110), (111), (112), (113),

I/F(114)

I/F(114) (44) (44) (43)

(113) MO가 MO

(43) (113) , (42)

108) (41) , ROM(103), RAM(104), HDD(105), FD(106), CD - ROM(

(113) , CPU(101)

, CPU(101) FD(106) CD - ROM(108)

PU(101) HDD(105) , (42) RAM(104) C

, CPU(101) , 10 ,

(41) (40) (51), (52),

(53)가

53) (51) (61), (62), (63) (

(64), (65), (66), (67), (68)

(43) (51) (61) , , (42) (43) FDD(107)

I/F(114) FD(106)

(62) , , (42) (113) (43)

, (62)

가

(52) (43) RAM(104)

CPU(101) (43) RAM(104) (53) RAM(104)  
 (64)

2 (64)

(104) (65) 1 (651), 2 (652), (653) (43) RAM  
 CPU(101)

1 (651) (62) 1

2 (652) (62) 2

1 (651)가 1 가  
 2

(653) 1 2

(66), CPU(101) (67), (68) (43) RAM(104)  
 (65)

(66)

(67)

(68) 가

D(106) (63) (42) (43) FDD(107) (43) I/F(114) F

AM(104) FDD(104) I/F(114) R  
 (43) CPU(101)

(43) CPU(101)가  
 RAM(104) : I/F(114) FDD(107)  
 ; RAM(104)  
 ;

CPU(101)

1 ; , 2 ;  
 , 1 ; 2 ; I/F(114) FDD(107)

(43) (42) (113)

(43) (40) (42) 9  
 가 (S1) (61)

1 (1) ,

, 1 (1)

, (1) , (S2) , 가  
 (40)

(fan - in)

, 가

, 1 (1) , 2 (3) , 2 (6)

, (6) (Cm2)가 " 0" (C2) ,

, (6) (Cm2)가 " 1" (C2) 1 (5)

(Cm1) , 가 " 0" 1 (5) . 1

, (2) , " (2) (5 6)  
 (3)" 가 .

, 가 (4) " (3) (7) (4)"

가 RAM(104) 가 ,

, (S3) , (S4) ,  
1 2

, 1 2 가 ,  
(62)

, 가 - .

5 S6) 1 2 가 , (S

, (S7) 가 가 , (S8)

, (S10) , (S9) - .

가 , (S11) 가 , I/F(114)

, 1 " (2) (5 6) (3)"  
가 , 2 (5 6)

1 (5) , (2)  
(Cm1) 가 " 0" 가 .

, (5) (Cm1)가 " 1" " 0" ,  
: Cm1 \* TEST ( , \* AND ).

2- AND 가 , " 2"

2 (6) , 1 (5)  
(Cm2) 가 " 1" 가 .

, (6) (Cm2)가 " 0" " 1" ,  
: Cm2 +/ TEST ( , + OR , / NOT  
) .

2- OR 가 ,  
" 2 + 1 = 3" .

" (2) (5 6) (3)" 1  
 , " 2 + 3 = 5" .  
 , 2 (3) -  
 (3) 2- , " 2 \* 2 = 4"  
 , " (2) (5 6) (3)" ,  
 2 1 .  
 " (3) (7) (4)" , 1  
 AND (7) 가 .  
 " 2" .  
 , 2 2 (2 4) -  
 , " 4" .  
 , " (3) (7) (4)" 1  
 .  
 (71) , 13 , - (12) (2) (5 6) (2)  
 (scan - in) (3) (3) - (13) .  
 (3)" .  
 AND , " (3) (7) (4)" (15) 가 .  
 (37) (7) 가 (4)" .  
 (1) (71) " 8  
 + 2 + (4 \* 2) = 18" .  
 1 (11) " 20" , 2  
 (31) " 24" .  
 (40) (71)  
 , 가 2 .  
 가 가 , 가  
 .  
 , (40) , 가 가 -  
 , (40) , , .

(40) ,

14 (T5 - T8)

(T7)

, RAM

, CPU,

가 가 ,

(40)

(40)

(stand - alone)

(42)

(13)

(43)

(42)

(13)

, FD(106)

(43)

(42)

(43)

RAM(104)

CPU(101)

(41)

(42)

(43)

HDD(105)

RAM(104)

CPU(101) RAM(014)

, CPU(101) HDD(105)

ROM(103)

FD(106) CD - ROM(108)가

, FD(106)

CD - ROM(108)

RAM(104)

HDD(105)

, CPU(101)

, FD(106)

CPU(101)가

가

(42) CD-ROM(108)

가 , 가 , 가

(57)

1.

1

2

1

2

2.

1

2

;

, 1 2 ;

;

3.

,

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4.

,

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;

가

;

1 1

2 ;

2

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, 1 2

;

5.

, ;  
 가 ;  
 ;  
 ;

6.

, ;  
 가 ;  
 ; 1  
 ; 2  
 ; 1 2  
 ;

7.

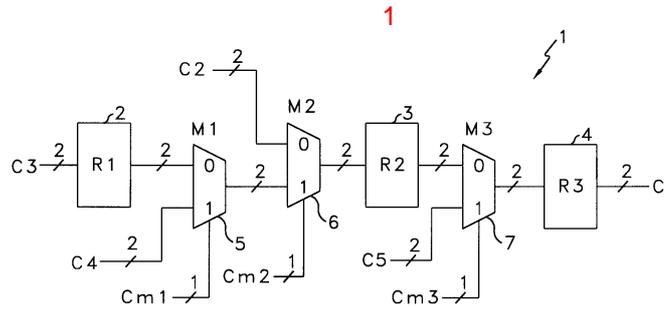
, ;  
 가 ;  
 ;  
 ;

8.

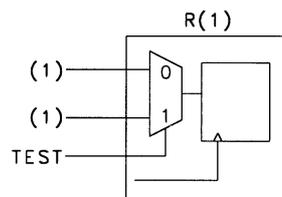
가 , 가 ; 가 가 ; 가 가 ; 가

9.

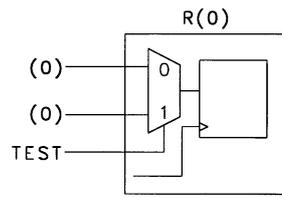
가 , 1 3



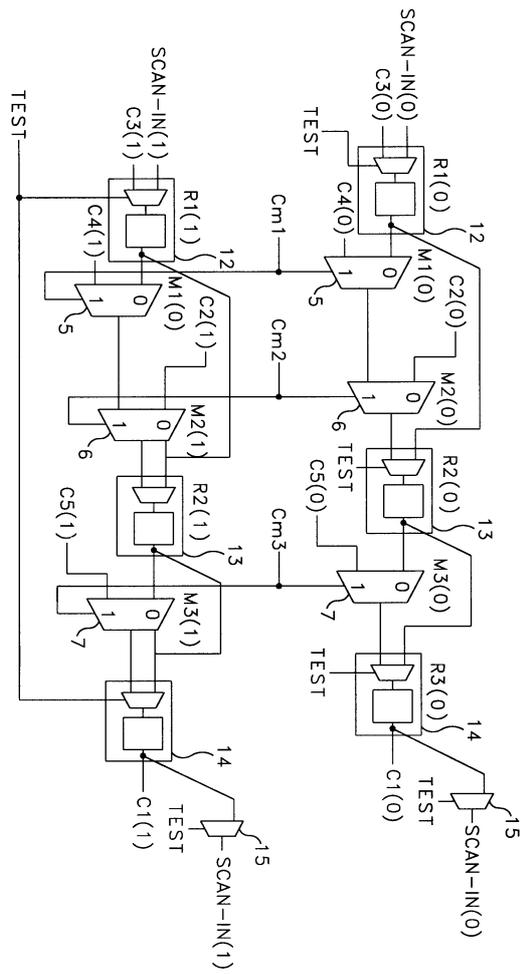
2a



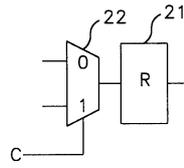
2b



3



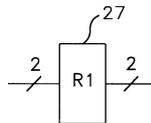
4



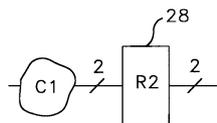
5

작동 모드	0측의 경로	1측의 경로
통상 모드 : 0 테스트 모드 : 1		
통상 모드 : 1 테스트 모드 : 0		

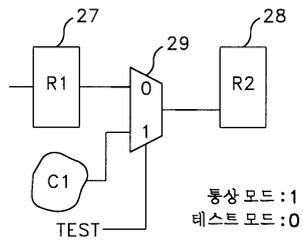
6a



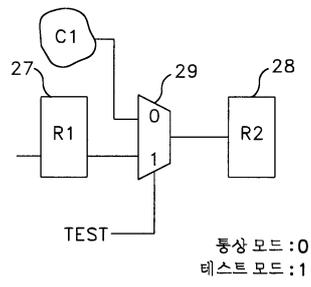
6b



7a



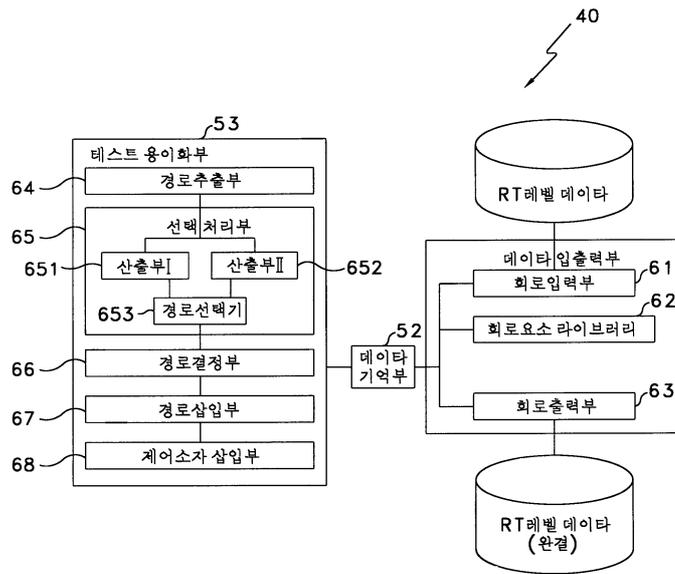
7b



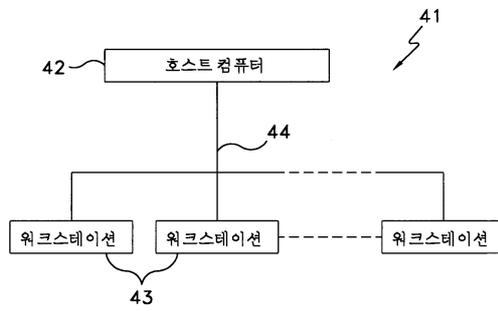




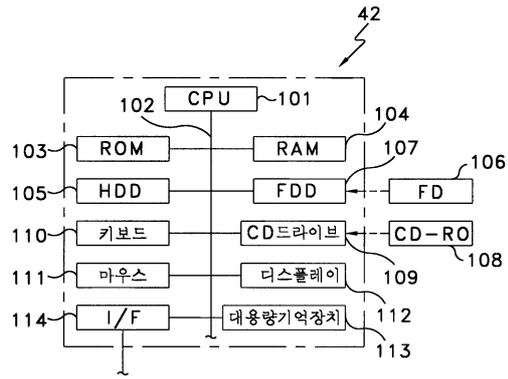
10



11



12



13

