



(54)

(deskewing)

(grided power distribution)  
(thermal gradient)

가 2

(spine)

(I/O)

가 가

(die creating skew)

가

(center taped fixed delay)

2

1

가

가

가

(discrete adjustment)

- 1
- 2
- 3
- 4a
- 4b
- 5a
- 5b
- 6
- 7

NAND

- 8a 4-
- 8b 3-

가  
가

(pre-global)

가

1

(AC)

가

(9), 2 (30,40) (PLL)(10) (2), (6), (3), (4),  
(7) (7) (20)

(3) (3) DRAM, SRAM,  
(CD-ROM),

AC (4) AC (4)

(hydride) 가 가

(20) 가 가

(9) (9)

(20) (6) 가 (2) (20)

(3) 가 (20) (3) (20)

(30,40) (20) PLL(10) 2

2 (20) PLL(10) PLL

PLL(10) (15) (30) XCLK5 PLL (9)

PLL(10) (400a,400b) (50a,50b)

(50a,50b) 가 (30,40) PLL(10)

(20) (60) 2 (100) (30)

40) (200) (165,166) 2 (2)

00) LSB(310a) LSB(310b) (300a)

(300b) (LSB) (200)

(400a,400b) (capacitive loading) (200)

(315a) (315b) (315a) (315b)

) (300a) (300b) 가

(400a) (400a) (400b)

(30) (40)

(400a) 가 (300a) LSB (300a) LSB 가 (400a)

(315a) "0" (300a) MSB (300b) LSB (315b)

(400b) 가 "1" (300b) LSB (400b)

(40) "0" (300b) MSB (300b) MSB (400b)

(40)

3 2 (160a,160b), 2 (140a,140b) (150)  
 (100) 2 (30) (40) (160a,16  
 0b) (160a) (161) (40) (30)  
 (160b) (162) (40)  
 (161,162) (140a,140b) 가 (40)  
 (160a) (30) (160b) (40)  
 가 (30) 가

4a (100) (160a) (160a) 4 RS (470)  
 (161) (140a), (460) NAND (470)  
 496) (40) (163), (163) NAND (496)  
 (460,462) 1 RS (470a) NAND (496) (430)

RS (470a) (464) NAND (480) RS (470b) 2  
 (466) NAND (482) RS (470b) NAND (480,482)  
 (430) , RS (470b) RS (470c) , RS (470c) RS (470c) RS (468)  
 470d) , NAND (484,486) NOR (430) NOR (492) NOR (492)

2 (165) (140a) (tap) 7  
 (140a) (ps) (matching)  
 (163)가 15 (ps)

4b (160b) (160a) RS (470)  
 (cross coupled) NAND (471,472) (metastability)  
 NAND (471,472) RS(Reset Set)  
 "0" "1" , , VCC VSS( ) 가  
 가 가 (false) 가

(160a,160b) (200)  
 (30) (165,166) 2 (165,166) 가 (30)  
 (40) (40) "01" (40) (30)  
 "00" (30) (40) (150)  
 (161,162) "11" 가 "11" (160a,160b)  
 RS (470) ("11" NAND)

100) 2 (168) (200) "00" 가 ( )  
 (pre-shutdown)

5a (200) (LSB)(310a,310b) (100) (165,166) (40)  
 0a,400b) (30,40) (400a,400b)

(latency) 3 . 5 . 4  
 가

("CHKANDJUMP") (225) (225) , (3  
 (300a) (300b)  
 0) (40) LSB(310a,310b)  
 (165,166) (30) (40)  
 (300b) LSB(310b)가 "0"( 가 ) (224)  
 (300a) 1 (200) 가 (30)

0b) 가 가 (upband) ( 216) , ( 220),  
 (CHKANDJUMP) (225) 가 (224)

(222) (222) 가 (218)  
(219) (30) (40) (300b)  
LSB(310b)가 "1"( (300b) MSB "0" (223) "1"  
(221,217,213,211) (200)가 (222), (219).  
(223,224,222,218) (40) (30)  
(ILLEGAL) (212,214) (200)가  
가 (225) ("PWRRST") 가  
(RESET) (210) (200)가 (300a,300b) 가 (30  
0a,300b) (300b) 가 "0" (200) (300a)  
(300b) 가 (300a)가 가 2 가 (224) (217)  
0b)가 가 "1" (310a) "1" (30  
(200) (interlock)  
(100)가 가  
(300b) LSB(310b)가 "1" ( 가 ),  
(300b) 1 (200) (30) 가  
(40) LSB "1" 가  
(215) (corruption)  
(215) LSB "1"  
(power supply)  
(lagging)  
5b 5a 가 가 5b (520) 5a (LB)(500,510)  
(520) 2 5a (200)  
(520) 가 / 가 , D - , JK -  
(200) (165, 166, PWRRST, 310a, 310b) (165,166) 3 (1  
00) 2 (165,166) (30) (40)  
(30,40) 3 (200) (310a,310b)  
PWRRST - (300b) LSB (520)  
(300a) (200) 2 (200) 2 (315a)  
(315b) (315a) (300a) (315a) 가  
(30) (300a) LSB "1"  
(300a) MSB "0" (315b)  
(300b) (40) (300b) LSB "1"  
(315b) 가 (300b) MSB "0"  
(200) (315a) (315b) , 5a  
(30) (300a) (300b) LSB  
(100) (300a) (300b) LSB  
5a (520) (520) PWRRST  
(570) LB(500) 4 4 (550) 5a (210) "0000"  
(asserted) (550)  
PWRRST  
LB(500) (520) , LB(500)  
(570) (520) 4 , LB(500) (165,166),  
(550) LSB(310a,310b) , LB(500) 5a

가  
 , LB(500) (550) "0111" "1111" , LB(500)  
 00) (520) "1111" (550) "1100" "0011" , LB(5  
 220,222,224) (520) "1111" 5a (213,216,217,219,  
 가 , LB(500) (520) "1111" (550) "0010" "0100"  
 , LB(500) 가 , "0101" (200) (LB 500 ) (315a)  
 가 (315b)가 가 , 가 ,  
 가 5a (212,214,215) 5a (550) , LB(500) (550)  
 (200) . LB(500) , "1101", "1110", "1100", "1000"  
 , "1011", "0111", "0011", "0001", "1111" (520)  
 5a (211,213,217,218,221,222,223,224 225) , LB(500) (550)  
 LB(510) (550) (315a,315b) (315a)  
 (200)가 "1" (300a) LSB "0"  
 (300a) MSB (315b) (200)가 "1"  
 (300b) LSB "0" (300b)  
 MSB LB(510)가 (315a,315b) "1101", "1000", "1011" "0001" 가 (550)  
 5a (211,218,223) (150) AC  
 , 3 (30,40) 가  
 (150) (165,166) 가 7  
 (150) ( ) 가 "0" ) . ( )  
 30) (40) 가 (correction) 가  
 6 "1" 가 , (140a,140b)  
 (40) , (161,162) 가 , (30) (30)  
 (step delay)  
 (160am160b)가 (40) (30)  
 가 (165,166) 가 ,  
 (150) AC (DSP)  
 가 (conservative)  
 10 (μs) (time out) 3 (151) 가  
 가 (153) 1 가  
 7 (152) 가  
 2 (400a) (300a)  
 8 (401a,401b) , (pass)  
 (410a,420a)가 가  
 (300a) . 2 , 가 2  
 (401a,401b) NMOS(440) P  
 MOS(430) 가 (monotonic) (16 )  
 16 (0-15) 15ps ,  
 16 16 가 2 (401  
 a,402a) / 가 . 2 0-14 (420a) 8 (401  
 , 2 1-15 (410a) 8 (200) 가  
 , 가 , "1" LSB(310a) "0" MSB(3  
 20a) (410a,420a)  
 , 8a LSB(310a) 4 "1" 4  
 (300a) (200)가 (40) (30)  
 (300a)가 LSB(310a) "1" , (200) MSB(

320a) "0" 8b (400b) (300b) (400a) (300  
2 a)

가

(57)

1.

;

2.

1

1

2

1

2

1

2

3.

2

3

2

1

1

가

2

, 3

1

2

가

2

가

1

4.

3

1

2

"10"

, 2

2

"01"

, 3

2

"00"

5.

4

1

2

2

"11"

6.

2

7.

1

2

2

;

8.

7

7 9.

1 10.

가

7 11.

12.

가

가

13.

14.

15.

16.

17.

17 18.

가

19.



18

20.

17

21.

20

22.

20

가

23.

가 - ;

가

24.

23

1  
2

1

가 ;

1  
1  
1

2

가 ;

2

가

;

-

,

가

1

2

1

1

2  
가

2  
가

25.

24

가

(20)

(20)  
(100)

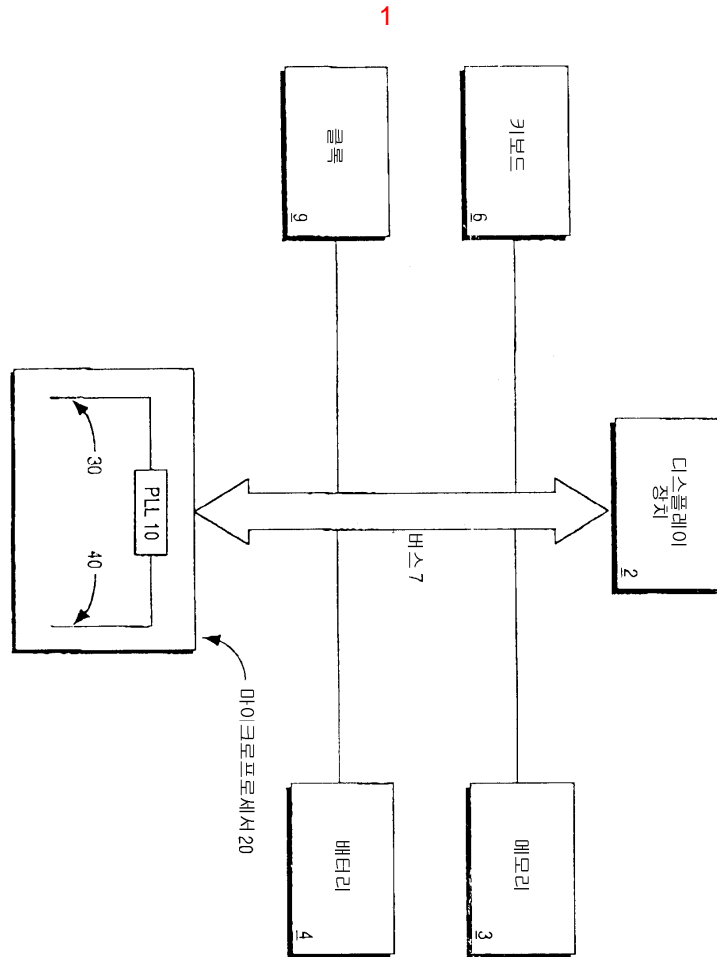
(300a,300b)  
(200)  
400b)

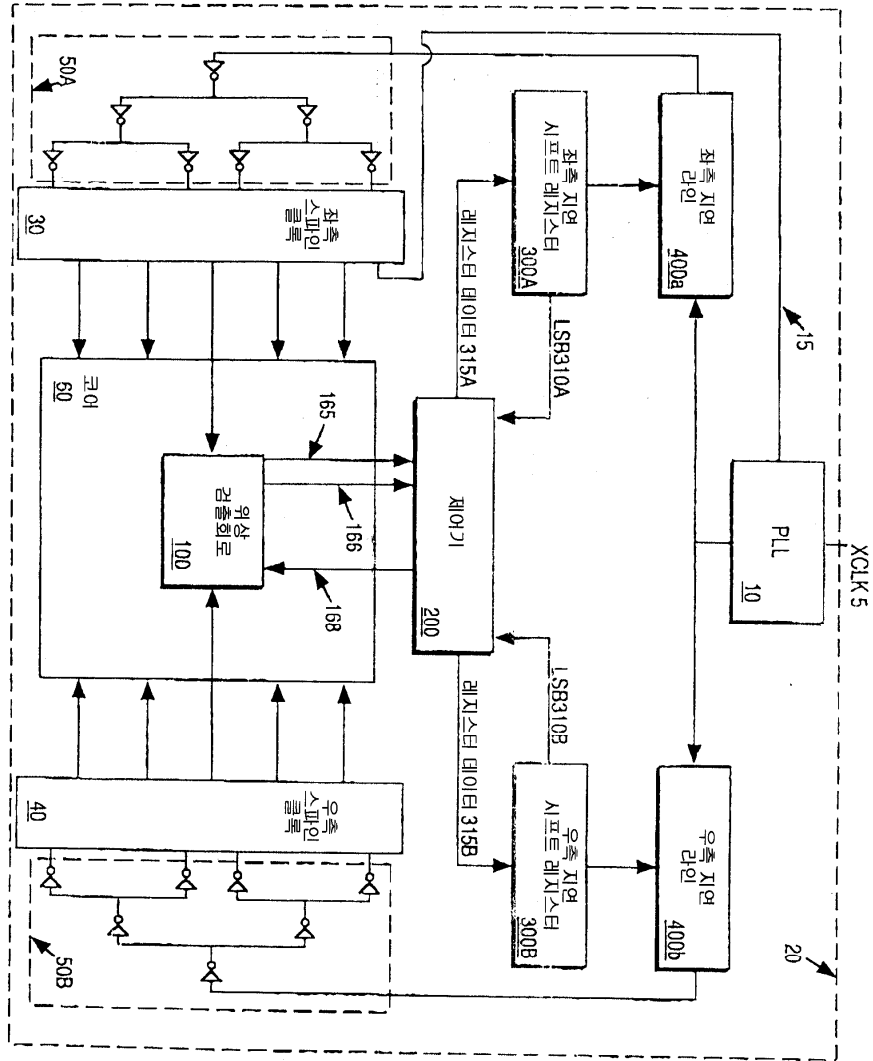
(200)

(100)

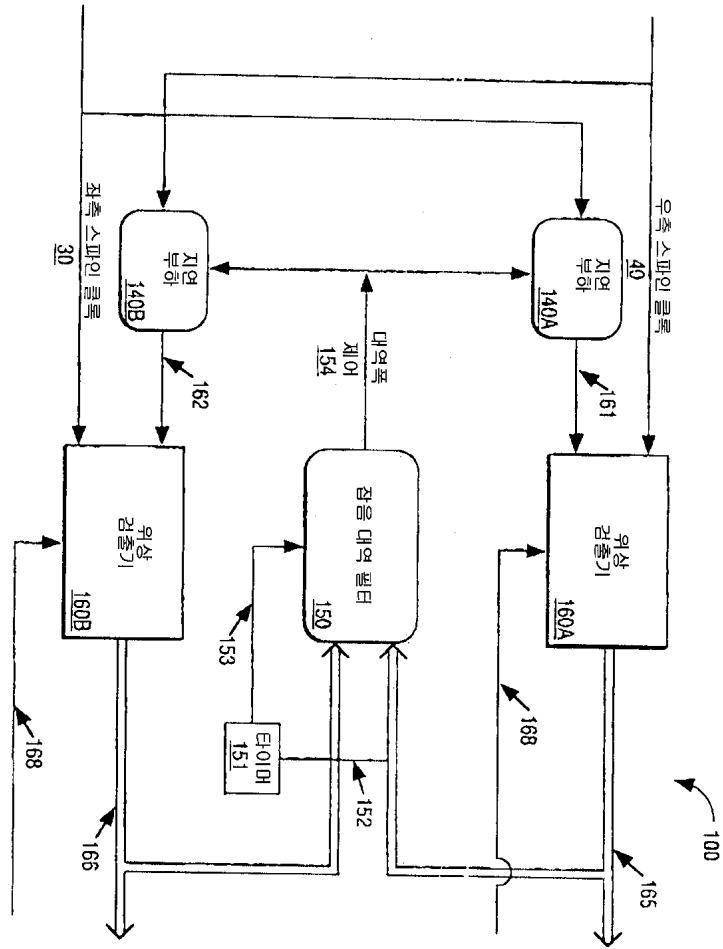
(100)

(400a,

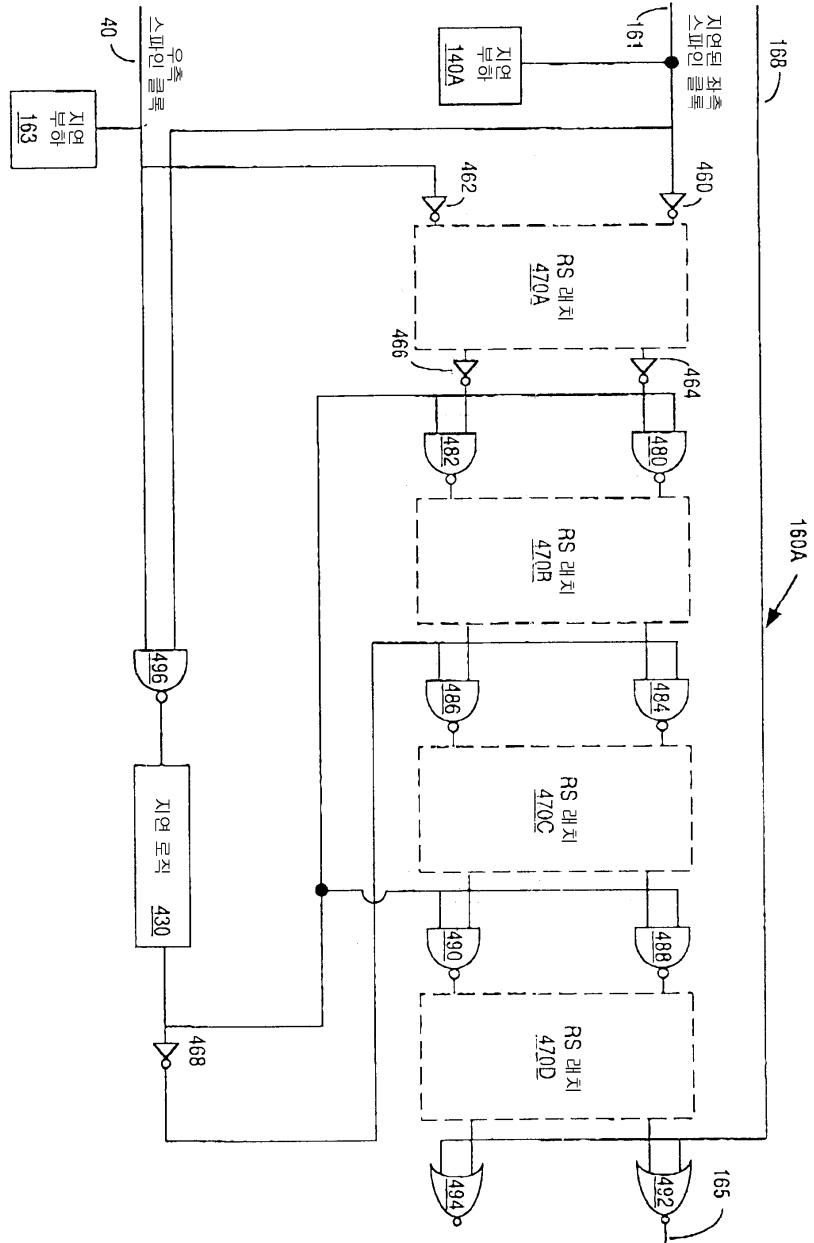




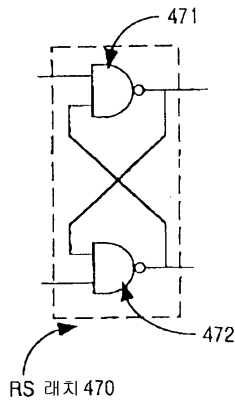
3



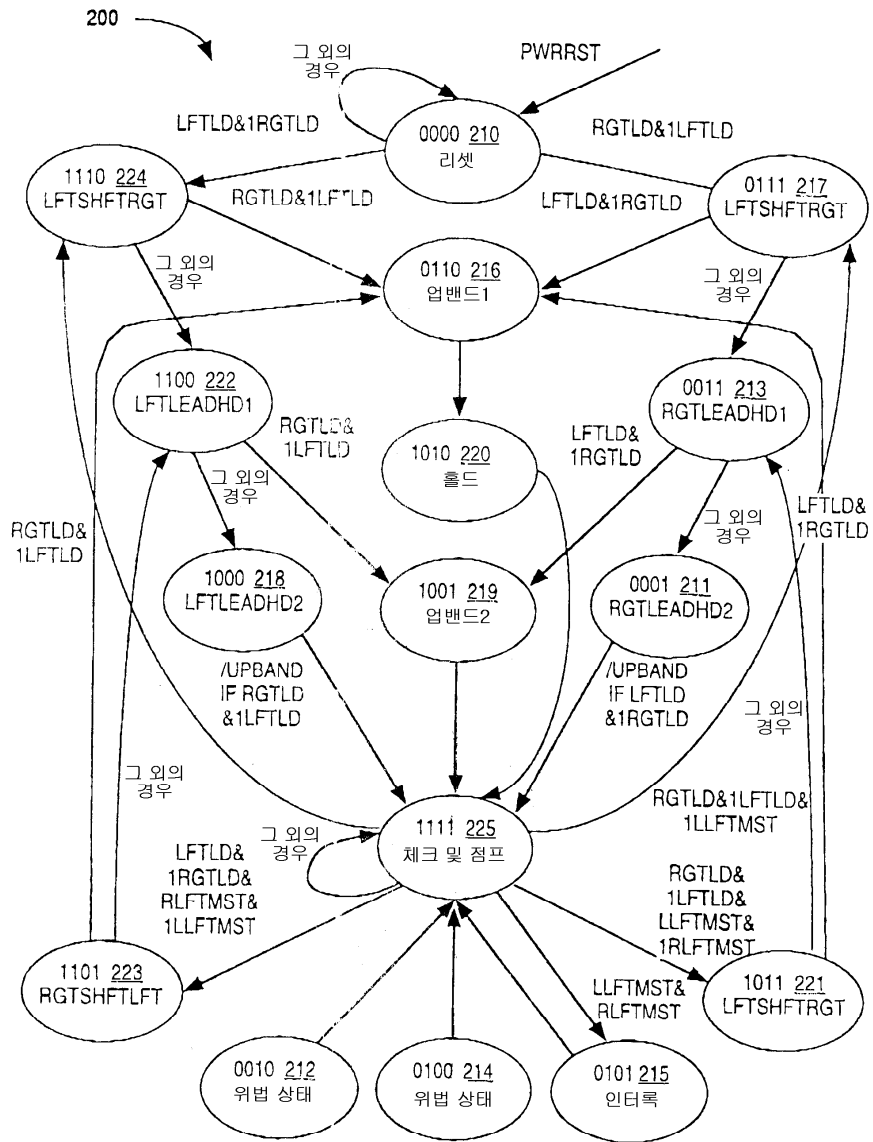
4a



4b



5a



5b

