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(21) 10-2002-0064452
 (22) 2002 10 22

(30) JP-P-2001-00324357 2001 10 23 (JP)

(71) 가 가
 가 4 6

(72) 1 5-1 가 가

1 5-1 가 가

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(74)

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(54)

SRAM 가 LSI , , ,
 LSI SRAM , , ,

1

MIS , , ,

1			LSI	SRAM
2	1		LSI	
3	1			가
4	1		CNTS	
5	1			
6	5			
7			SRAM	
8				
9			LSI	
10			1	
11	10			가
12			2	
13			3	
14	13			
15	SRAM			
16	15			가
17	16		CNTV1	
18	7	SRAM	1	
19	7	SRAM	2	
20				
21	SRAM		1	
22	21			SRAM
23	21			
24	SRAM		2	
25	SRAM		3	
26	24		CNVT2	

< >

CHIP :

LOGIC, LOGIC1, LOGIC2 :

SRAM, SRAM1, SRAM2 :

POW :

VssQ :

VddQ :

Vss : ()

Vdd :

stby :

Vbn : nMOS

Vbp : pMOS

N1 N10 : nMOS

P1 P12 : pMOS

cntn, cntp, cntn1, cntn2, cntmn1, cntmn2, cntmn3, cntp1, cntp2, cntp3, cntp4, cntmp1, cntmp2, cntmp3 :

CNTS, CNTS2 CNTS5 :

VBBC, VBBC2 :

Vddl, Vssl, Vssl1, Vssl2 :

IO :

ack :

FF :

BUS :

BSCNT :

PDC :

MAR :

PERI1, PERI2 : SRAM

CORE : SRAM

WL :

BL, /BL

WDR :

RWAMP :

PRE :

CDEC :

RDEC :

MCNT :

Vddma, Vssma, Vddamp, Vssamp, Vddperi, Vssperi :

OBUF :

cntvbb1, cntvbb2 :

SW1 :

Vbpl, Vbnl :

Vbpm, Vbnm : SRAM

MEM1, MEM2 : SRAM

BLK1 BLK2 : SRAM

CNTV1, CNTV2 :

tox :

(SRAM) 가

7-86916

MOS

, 2000-207884

2001-93275

LSI

,

, SRAM
)
SRAM
가 . ,

가 . , SRAM

LSI(Large Scale Integrated Circuit:
. , SRAM ,
(DRAM))

MOS		가	가	MOS	가	.	IO
,		VBBC,	,	CNTS	1		POW
,	(	,	)가	SRAM	,	.	,
,	,	,	,	,	.	.	,
1 N1 IO		가	nMOS	MOS	.	N1	
가 N	P	MOS	,	가	,	,	
MOS N1	LSI	가	,	가 1	,	,	
MOS		N1	MOS	가	MOS	IO	가
,	MOS	N1,	N1	,	,	,	가
,	가	.	.	,	.	.	가
가	가	nMOS	,	, nMOS	pMOS	,	,
Vdd	pMOS	,	가	Vss	nMOS	,	,
SRAM	ACT	STB	1	3	SRAM	,	ACT
가	Vdd	1.2V, Vss	0.0V	Vdd	SRAM	,	stby 가
pMOS	가	nMOS	0V	Vss	SRAM	,	nMOS
	Vbn	Vbp	1.2V	SRAM	SRAM	,	MOS
	(	,	),	,	MOS	.	.
nMOS	stby 가	SRAM	.	nM OS	nMOS	cntn	pMOS
가	Vbn	Vbp 가	-1.2V	2.4V	, SRAM	, MOS	1.2V
가	가	MOS	.	,	MOS	.	가
stby	cntn	.	.	.	.	.	4
4	가	,	3	STB	stby	,	가
STB	ACT	,	STB	ack 가	stby 가	,	stby
stby	ack	,	cntn	5	가	,	stby
cntn	cntn	가	.	가	가	.	ac
5	.	CNTS	6	STB	.	.	.
.	.	,
7 1 SRAM	SRAM	PERI1	PERI2,	PERI1	SRAM	,	MAR ,
가 MOS	s_sw2	s_sw1	s_sw2m	.	PERI2	Vss	Vdd
p MAR SRAM	N	MOS	.	SRAM_CIR	P	MOS	stby
			Vbn				Vb
							.
	(	1 2 P	2 P	MOS	1 2 N	CMOS	.
	).	,	.	(BL, /BL)	1 2 N	MOS	.
MOS	,	.	N	MOS	WL	2 N	.
	,

	Vddma	Vssma						
WL	PERI1	WDR	PERI1	RDEC,	MCNT	Vddper	Vssper	
RWAMP	PERI2 CDEC	PRE, OBUF, Vddamp Vssamp PERI1 MAR, PERI1	BL		WCNT /stby Vdd가 MOS	STB PERI2	PERI2	RWAMP
Vss가 Vbp MOS	가 SRAM	PERI2						가 Vbn
7	, 2	, Vss	Vdd 가,	Vdd				가
		, Vss		Vdd	가		Vss , Vdd , SRAM	가
	Vdd	, Vdd				Vss		Vdd
가	Vss	, Vdd	Vss					,
7	1, 7	LSI SRAM			LSI		LSI	
MOS		MOS		, MOS 가 LSI	가			가
8 N	1 MOS	LOGIC		, NAND, NOR 가	LOGIC_CIR P MOS	P MOS	MOS	Vssi
9 MOS 7	LSI, 1 SRAM	SRAM (CORE)		MOS S_SW	LSI logic sw MOS		MOS	IO
2	P MOS N	16 MOS			LSI			
9	MOS	Vth가 0.40V LOGIC_CIR	0.25V SRAM	2 가	MOS SRAM_CIR Vth가	가	2 SRAM_CIR	Vth LOGI
MOS C_CIR		IO			MOS		MAR	
				(SNB)				PERI

< 5>

20 , 1 SRAM LSI SRAM

(57)

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MIS 1 ,
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MIS N MIS P MIS 가 ,
N MIS P MIS

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14.

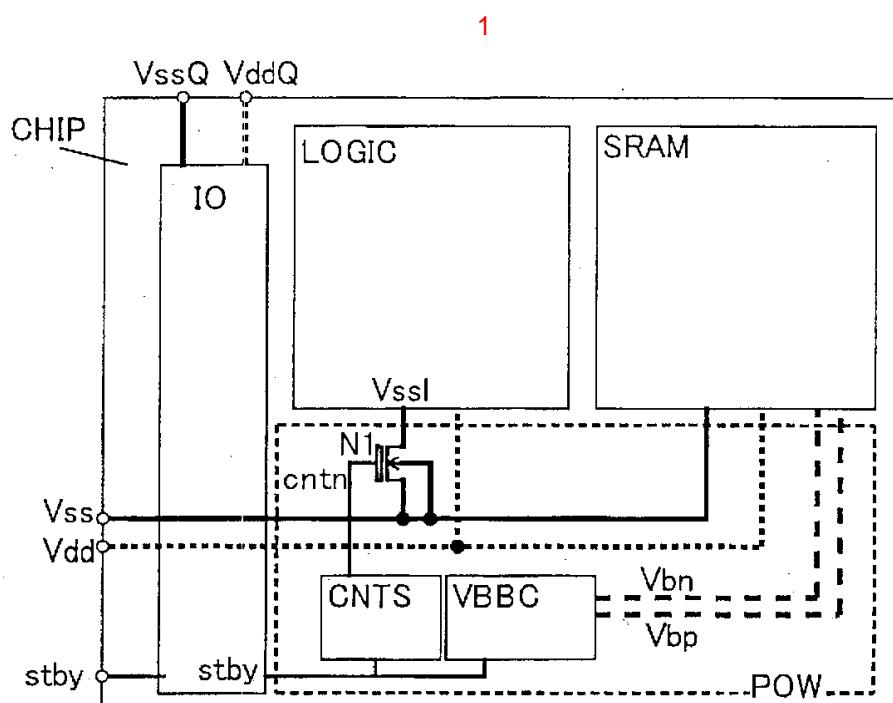
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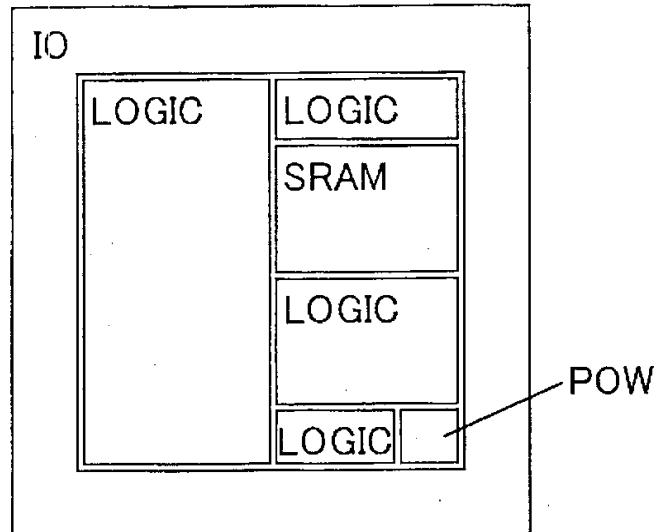
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MIS

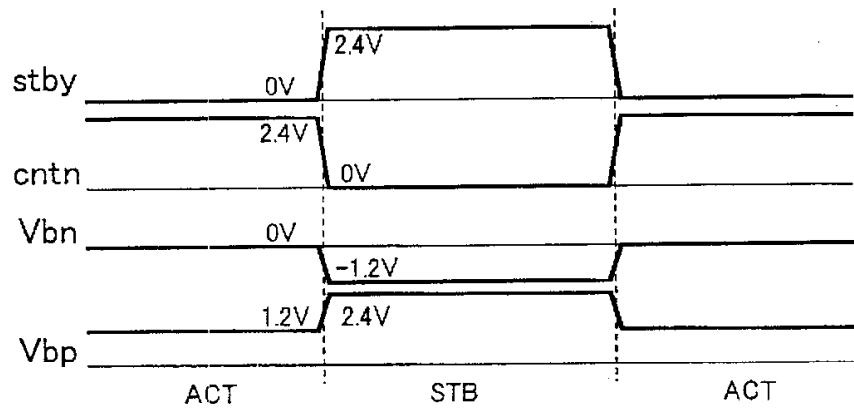
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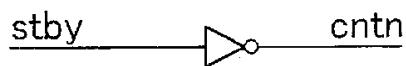


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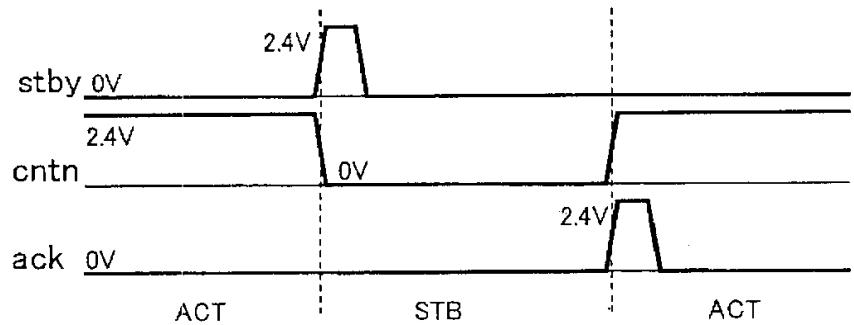


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CNTS

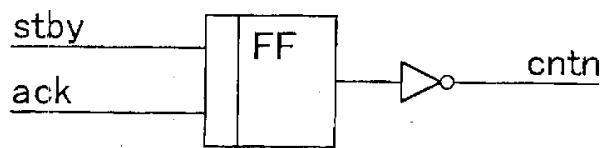


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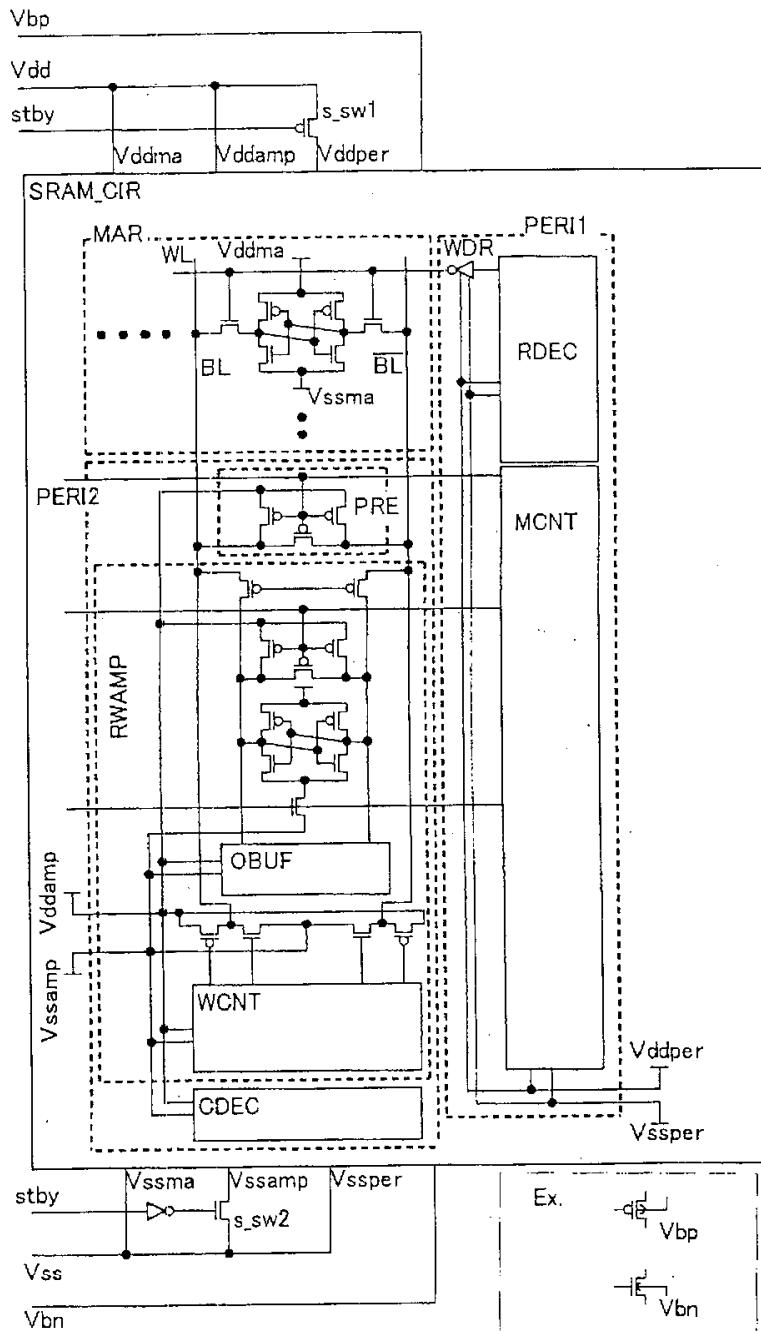


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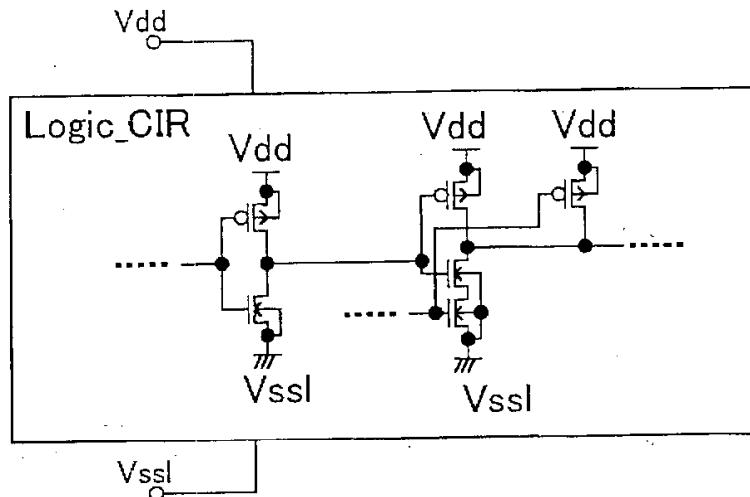
CNTS



7



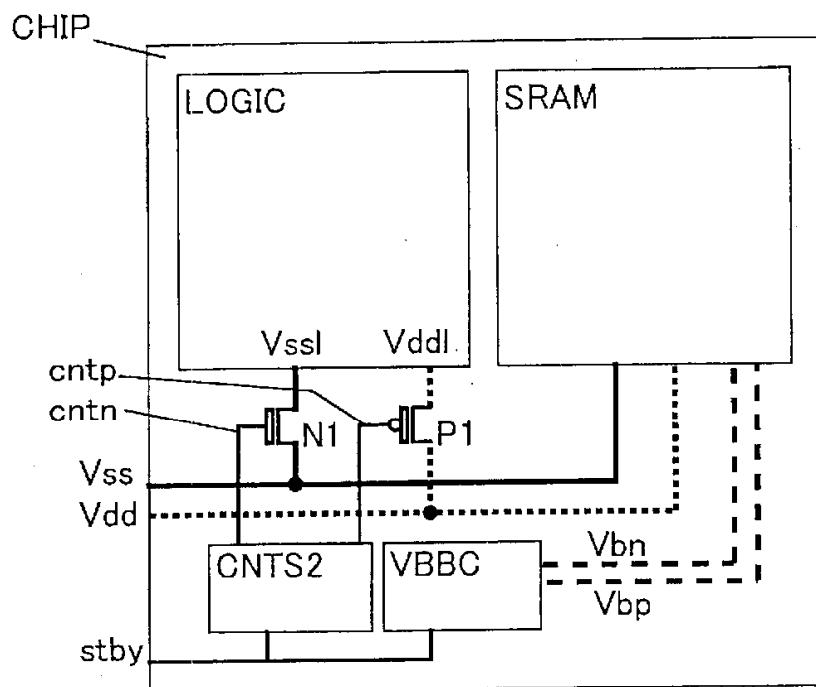
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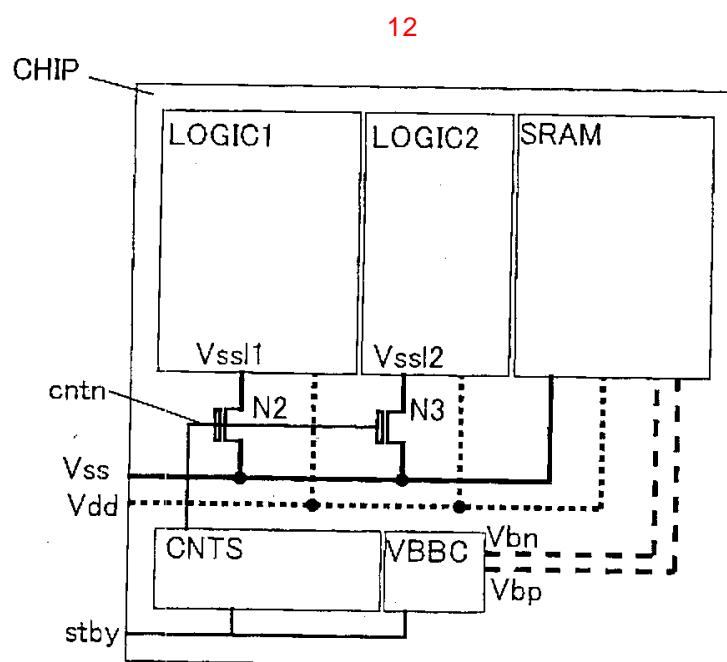
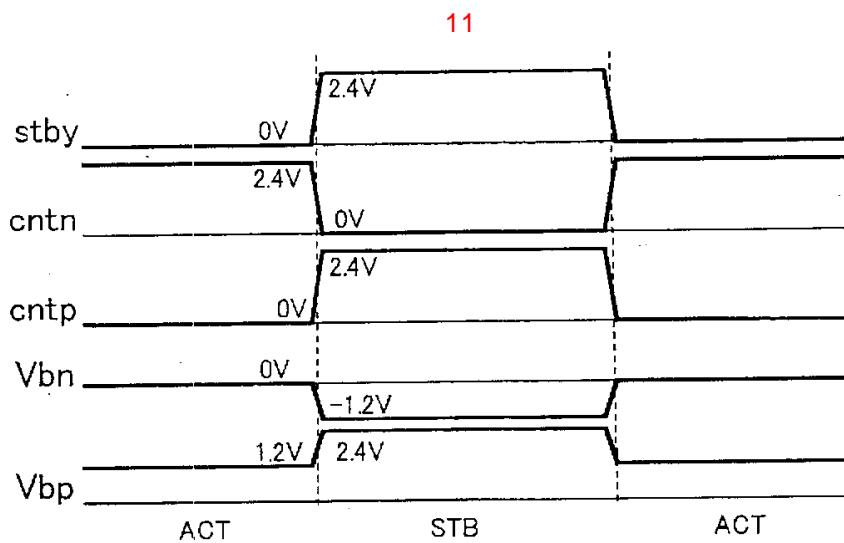


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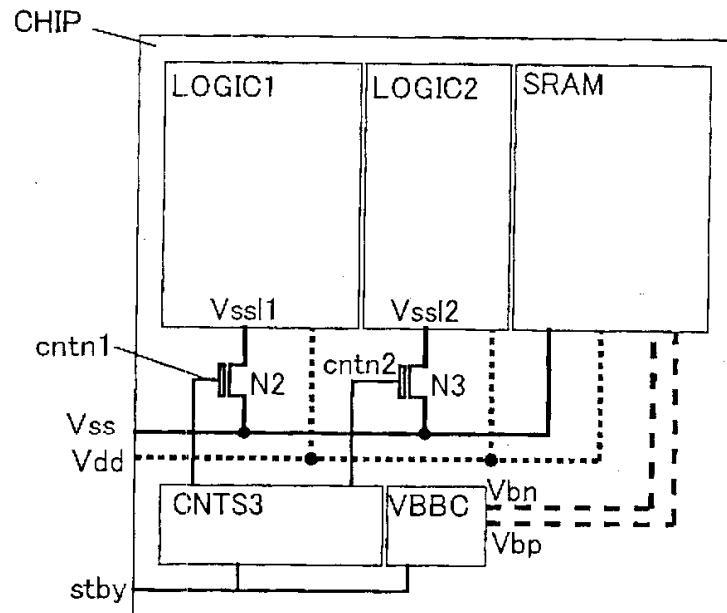
		Logic_CIR	Logic sw (N1)	SRAM_CIR	SRAM sw (s_sw1, s_sw2)	IO
Pattern1	Tox Vth	2.0nm 0.25V, 0.40V	6.7nm 0.80V	2.0nm 0.25V, 0.40V	2.0nm 0.40V	6.7nm 0.80V
Pattern2	Tox Vth	2.0nm 0.25V, 0.40V	6.7nm 0.80V	2.0nm 0.25V, 0.40V	6.7nm 0.40V	6.7nm 0.80V
Pattern3	Tox Vth	2.0nm 0.25V, 0.40V	6.7nm 0.80V	2.0nm 0.25V, 0.40V	2.0nm 0.40V	6.7nm 0.80V

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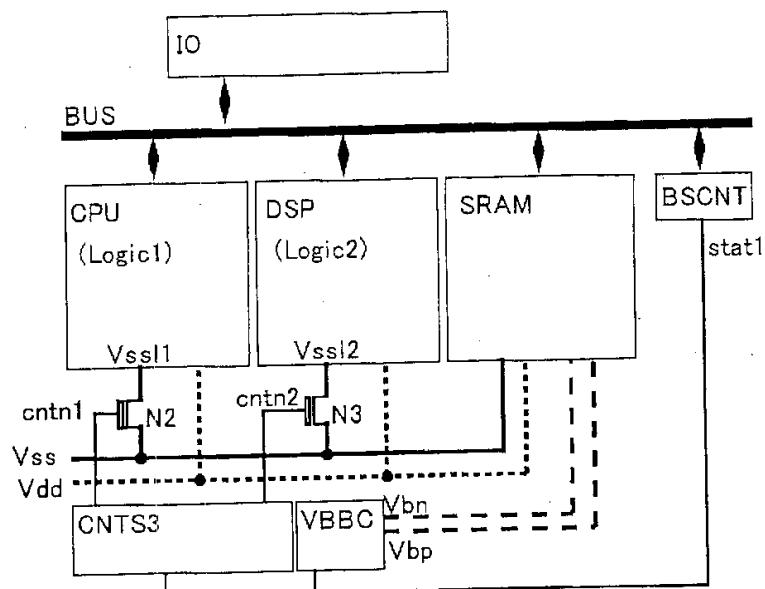




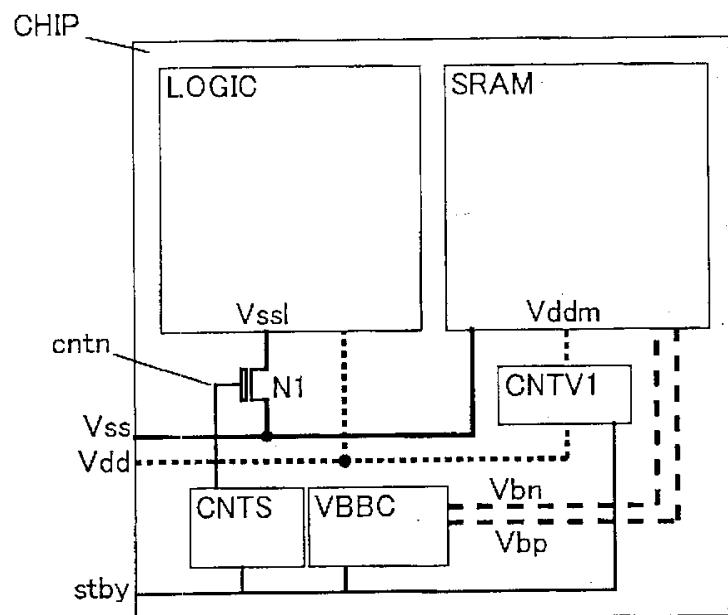
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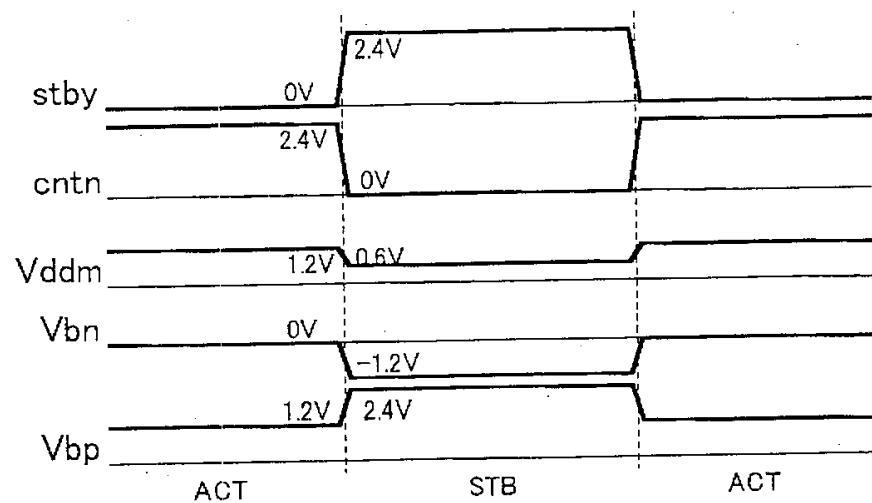
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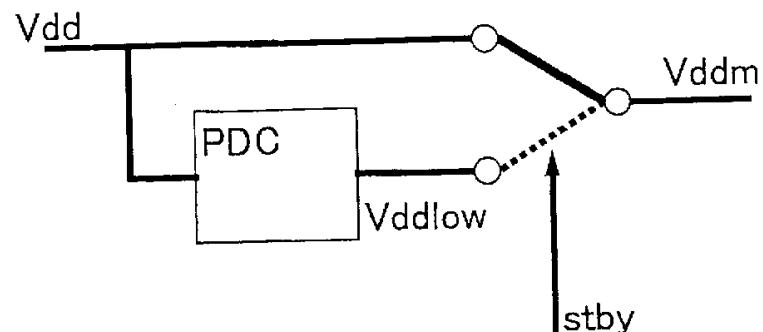


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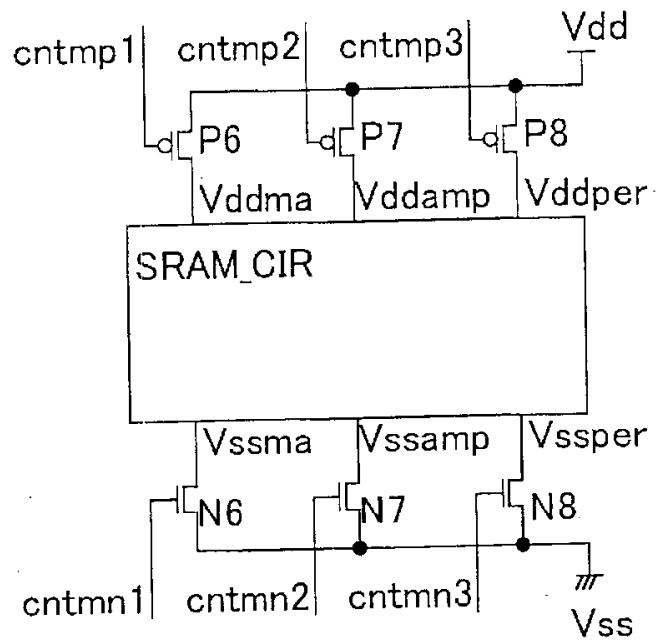


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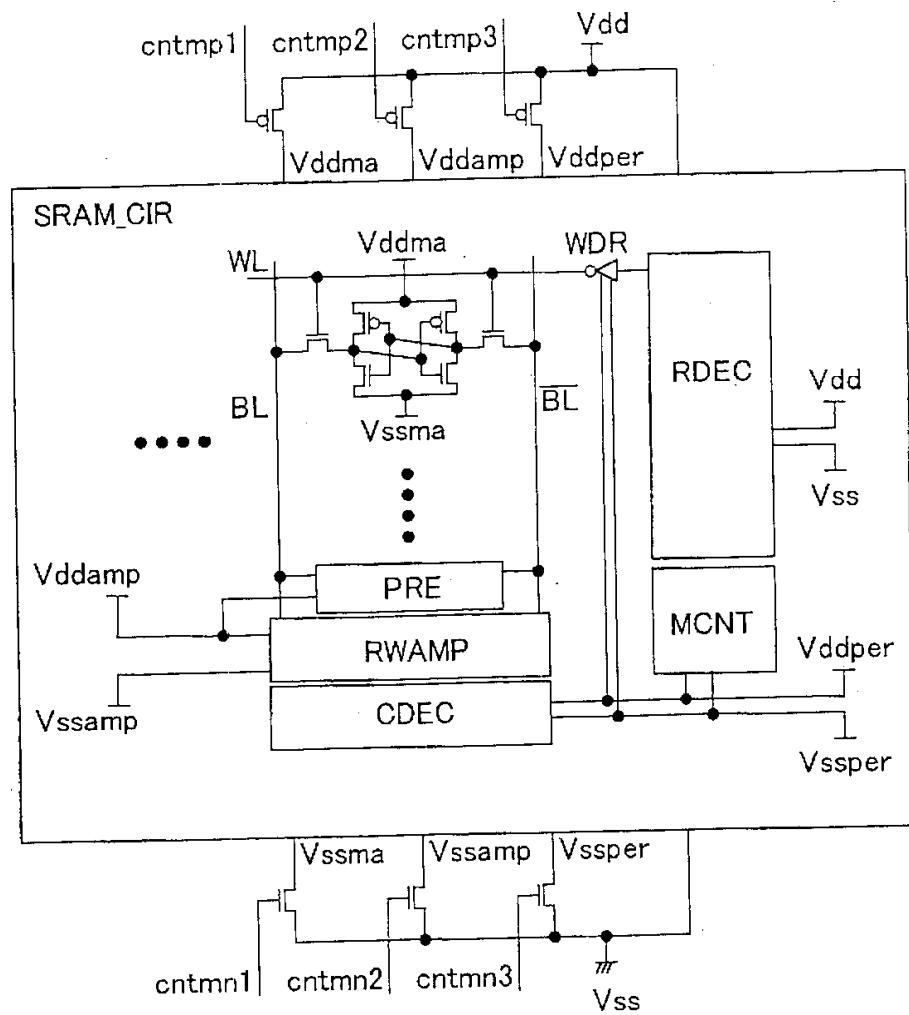
CNTV1



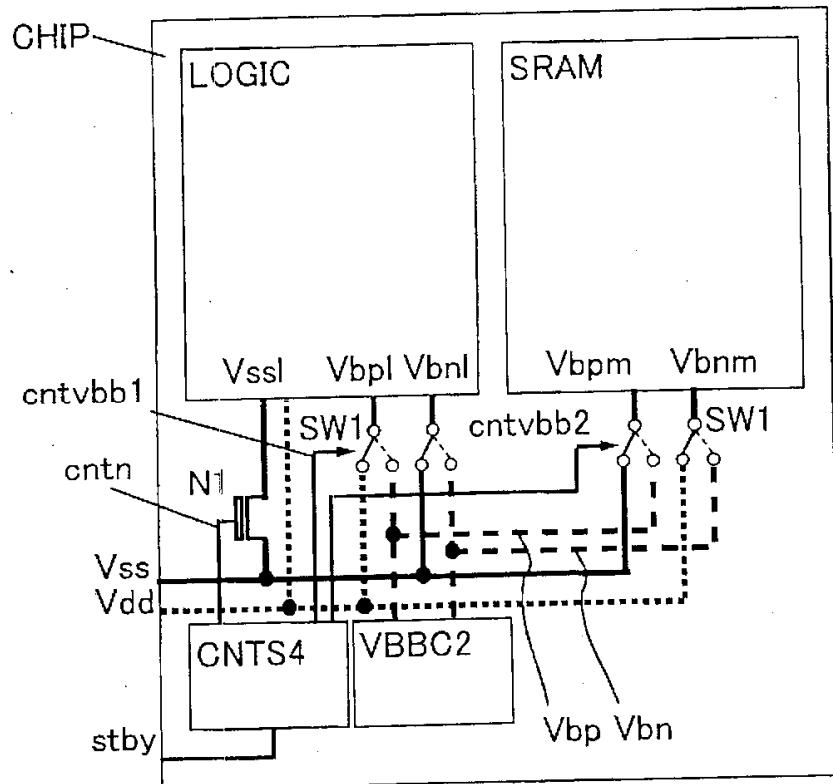
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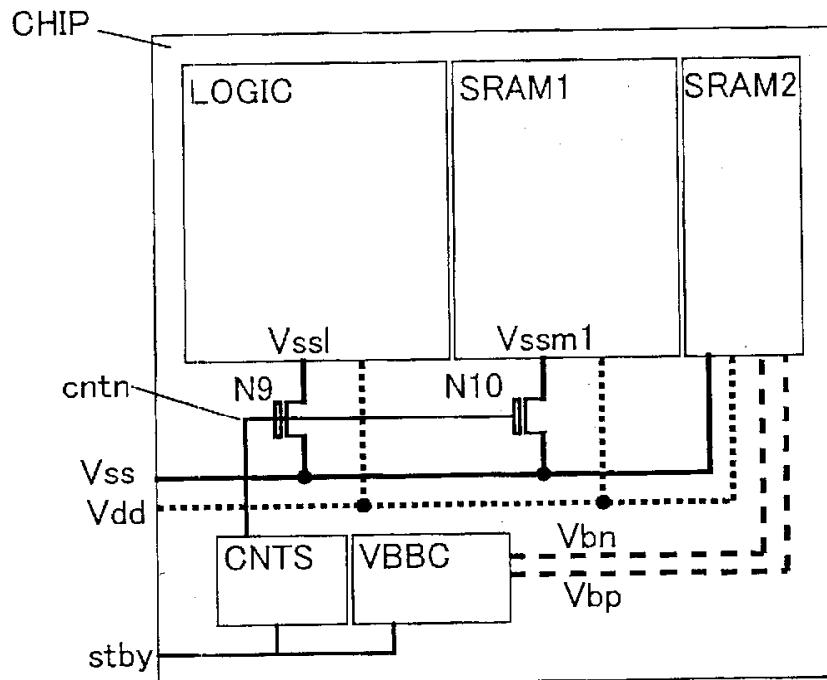
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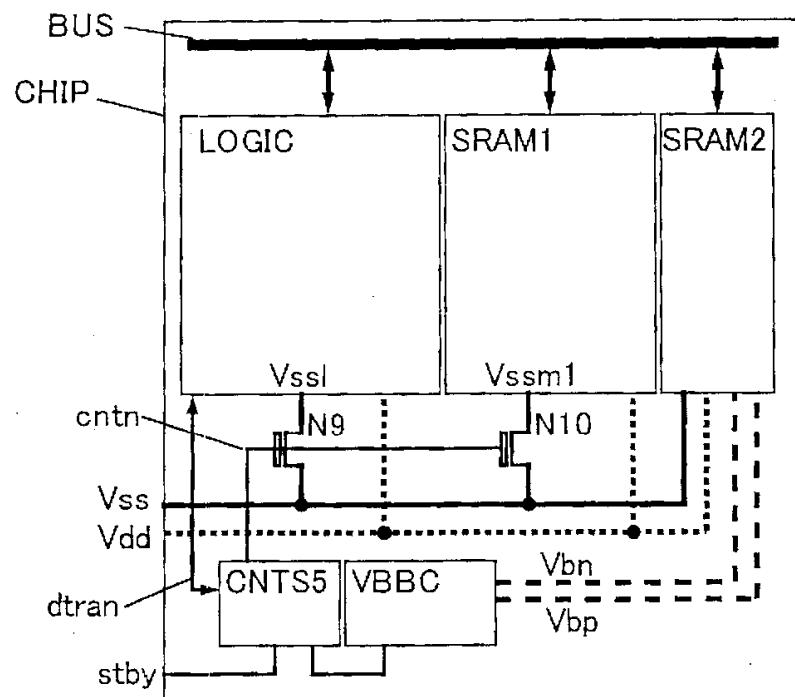
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22

		Logic_CIR	IO	MAR1	MAR2
Pattern1	Tox Vth	2.0nm 0.25V, 0.40V	6.7nm 0.80V	2.0nm 0.40V	2.0nm 0.40V
Pattern2	Tox Vth	2.0nm 0.25V, 0.40V	6.7nm 0.80V	2.0nm 0.40V	6.7nm 0.40V
Pattern3	Tox Vth	2.0nm 0.25V, 0.40V	6.7nm 0.80V	2.0nm 0.25V	2.0nm 0.40V
Pattern4	Tox Vth	2.0nm 0.25V, 0.40V	6.7nm 0.80V	2.0nm 0.25V	6.7nm 0.40V

23



24

