

(19)
(12)

(KR)
(A)

(51) 。 Int. Cl.⁷
G02F 1/1337

(11)
(43)

10-2005-0012178
2005 01 31

(21)

10-2004-0057658

(22)

2004 07 23

(30)

JP-P-2003-00279083 2003 07 24 (JP)

JP-P-2004-00205103 2004 07 12 (JP)

(71)

가 가

가 22 22

(72)

5-7-1

6-5-201

가

가 678-3-101

2613-1-417

(74)

:

(54)

OS 가 가 .

, 1 (11), 1 2 (12), 1 2

(13) ; 2 2 W2 1 2 1 W1

1 2 3 . 3 W3 2μm 14μm

2

, , , ,

- 1a, 1b 1c , MVA LCD
- 2 LCD(100)
- 3 LCD(100) (100a)
- 4 , OS LCD(100)
- 5a 5b , 25 5 , MVA LCD OS
- 6 , (LC) W3 LCD , 5a 5b
(bottom value)
- 7a 7b , (angular response) 가
- 8 LC W3 3 LC R3
- 9 6 3 LC R3
- 10a 10b , 가 LCD
, 10c LCD
- 11 (22) (13A) (13a)
- 12a 12b , LCD
- 13a , LC W3 d , (turnaround time)
, 13b
- 14a ~ 14c , LCD LCD OS
- 15 , 14 OS
- 16 LCD
- 17 LCD
- 18 LC W3 LCD , OS (V32) 가
(black voltage)
- 19 LC W3 LCD , OS (V64) 가
- 20a 20b , MVA LCD

<

>

100: LCD

10a, 10b:

11:

12:

13

21:

22:

52:

가 , (LCD)가 TN LCD 가 , TN LCD 가 , (visual angle dependence) 가 . LCD가 , LCD MVA LCD가 . 2947350(1) , (normally black; NB) LCD () 가 , LCD , PC (PDA) (high definition) (1) , (grayscale) () 가 , 1 . MVA LCD , 1 , 1 - - 가 10msec 가 (, 1 107 ~ 110). , LCD (OS) , 가 (OS) 20 00-231091(2) , OS MVA LCD가 , 2 , (, 2 8). OS (1.25) 가 , .

가 , MVA LCD 20a 20b LCD OS ,

20a 20b , MVA LCD (20a) (MVA LCD OS (32/255))

32/255' 1 (92) $\gamma^{2.2}$ (32/255) $^{2.2}$ (V0 가) 0, (V255 가) V

32 .

OS , LCD 가 , 20a

OS , 가 , 20b (92) (92a)가 (92a)가 (dark belt)(92b)가

가 가 , TN LCD OS ((stripe shape)) () LCD

가 가 LCD

< >

1 1 2 1 2

1 2 3 2 1 1

2 3 2 μm 14 μm

1 1 2 2

3 12 μm 8 μm

1 1 2 1 2

2 2 1 1 1

1 2 3 1 2 3

32/255 가 1 2 μm

2

1 2 2

3 1 16.7msec

, 8 μ m, 3, 2 μ m 14 μ m, 12 μ m,

, 1 (rib), 2, 2 (slit)

) .

, 1 4 μ m 20 μ m, 2 4 μ m 20 μ m .

, 1, 2 .

, 3 μ m .

, 2 / 3 .

, 3 / 2 1.5 .

, , , 1, 2

, , 45 ° .

, 가

, , 1, 1, 2, 1, 1

2, 1, 2, 3, 2, 1

, 1, 14 μ m, 2, 3 μ m, 3

, , 가

, 가 1

, , OS LCD, LCD, PDA, LCD TV, LCD가

, LCD, 1a, 1c

(11), 2, (12), LCD, 1, (11), 2, (12), 1, (11), 2, (12), (13), 87 °, 90 °, (13)

(11), 13), 가, (11), 2, (12), ()

(13) 1 (11) 1 (21,31,41) 2 , (13) 2 (12) 2
 (22,32,42) . 1 2
 , (13a) , 1 2 가
 1 (11) 2 (12) 가 , 1a 1c (13a)
 가 () . , 1 2
 () .

1 2 (, ,)
 , 1a 1c (extension)
 , 180 ° (13a)가
 () .

2 , 1a LCD(10A) , 1 (21) , 2
 (12) () (22) (21) (22) (21) (21)
 , (21) (13a) (13a)가 (21)
 (22) (22) , 1 (11) 2 (12) (13a)가 가 ,
 (13) (13a)가 (22)
 (21) (22) , 가
 (21) (22) () .

1b LCD(10B) , 1 2 (31) (32)
 , 1a LCD(10A) (31) (32) ,
 , (31) (31a) (32) (32a) (13a)
 , () .

1c LCD(10C) , 1 2 (41) (42)
 , 1a LCD(10A) (41) (42) , 1 (11) 2 (12)
 가 (41, 42) (13) (41) (42) ,
 (13a)가, (41, 42) () .

1 2 /
 . 1 (11) 2 (12) (13) , 1 (11) , 2 (12)
 , 1 (21) , 2
 (22) LCD(, 1a LCD(10A) LCD) 1a
 LCD(10A) 가 ,
 가가 ,
 ,
 , 가 , 2b , 1 2
 2 14μm , 1 2
 . LCD .

2 3 , LCD
 , 3 LCD(100) (101a) 2 LCD(100)
 a LCD(10A) 가 , LCD(100) 1
 .

LCD(100) , 1 () (10a) 2 () (10b)
 (13) . 1 (10a) (11) , (21)가
 (11) (13) (21) (11)
 () (21) 3 ,
 (21) () P (21) ()
) W1 .

(13) 2 (10b) , () () (5)
 1) , TFT() , (52)
 (52) (12) , (52) , 1.5 μ m 3.5 μ m
 (12) /
 가 . , .
 (12) (22) , (22) (12)
 () (22) , 3 (22) () W2
 (21) . (22) (,)
 , , .
 , (21) (22) W3 (13A)
 (13A) , (21) (22) .
 () , (13a)가 180 ° , (21) (22)
 . 3 , LCD(100) , (21) (22) 90 ° 2
 (100a) (13a) 90 ° 4 (13A)
) (21) (22) , ,
 .
 1 (10a) 2 (10b) () , ()
 - 45 ° , , 90 ° 4 (13A)
 (retardation) 가
 (21) (22) 45 °
 , , ,
 , .
 MVA LCD(100) , LCD OS
 20b . 4 5 , .
 OS LCD(100) 가 . 4 ,
 . x , (21) (22) , 5 °
 , 0msec(V0 가 , ; (22)
 가 16 msec, 18msec, 500msec OSV32 가), OSV32
 1 = 16.7msec), OSV32 가 500msec OSV32 가 (V32
 가 y- , 0 , 500msec 3 LC
 R3 0.1 .
 LCD(100) d 3.9 μ m ,
 P 53 μ m , (4 μ m x 2) (21) W1 16 μ m , (22) W2 10 μ m
 , (13A) W3 13.5 μ m . (V0) 1.2V , (white voltage)(V255) 7.1V ,
 y 2.2 32 (1.04%) (V32) OS (OSV32) 2.44V 2.67V
 . OS (OSV32) , (V0 가) 16msec () 32
 .
 4 (13A) , (21) (21a) (' 1
 LC R1') 가 , , 18msec 가 , 가
 , 1 LC R1 , (13A) , (22) (' 2 LC R2') ,
 (22) , (21) (22) (' 3
 LC R3') 가 .
 , (21) (22) (13A) , 가
 3 LC (R1, R2, R3) 가 .

가 LCD(100) , 1 가 ((21)) 2 ((22))
 가 , 3 LC . 1 2 LC (R1 R2)
 가 1 LC (R3) .

25 , 5a 5b , (100a) 0% , 32 . 5a 5b 100%
 , y 0

5a 5A-1 5A-2 , d가 $3.9\mu\text{m}$, OS OS
 , 5A-3 5A-4 $2.8\mu\text{m}$, OS OS
 OS
 5B-2 , d가 $3.9\mu\text{m}$, OS OS
 OS
 5B-3 5B-4 $2.8\mu\text{m}$, OS OS
 OS
 Pa·s (rotational viscosity) γ 1 $20\text{mm}^2/\text{s}$ (flow viscosity) ν 가 140m
 (d x Δn) 가 300nm

5a 5b , 25 5 , OS
 , OS 가 (100%) ,
 가 ,
 (horn response)' .

5a 5b , 가 5
 , 5a 5b , d가 가 ,
 20b .

20b (dark belt)(92b)가
 4 1, 2, 3 LC
 R1, R2, R3 가 4 ,

(21) 1 LC R1 , (21) (21a) , 가
 32 OS (OSV32) 가 1 0
 , V32가 가 (4 t=500msec , 1 LC R1)
 , OS (OSV32)
 (2 3 LC R2 R3), 가 , OSV32가 가
 V32 .

V32 가 (t > 16.7msec) , 1 LC R1 , V32
 , 2 LC R2 3 LC R3 V32
 가 .

OSV32 가 V32
 가 (V32) , OSV32 가
 V32 가 , 가 (2 LC
 R2 3 LC R3) 가 , 가 ,
 , 가 .
 5a 5b .

OS TN LCD , TN LCD , TN LCD
 , ()
 (2)
 가 . , ,
 LCD , , (1) ,

OS 가 가 (OS d, P, W1, W2, W3) 가 .
 , 2 3 (MVA LCD , LCD 가 .

5a 5b d 가
 , 가 W1 W2 가 가 W
 1, W2 W3(LC W3) 6

6 , d, 가 가 6 LCD , LC W3
 , 5a , OS 가 (' LCD (bottom transmittance)') , 32 100%
 W1 W2 5 μ m 20 μ m d , P 25 μ m 58 μ m
 , 6 , 25

6 , , LC W3 , 6 (W1 W2 가 , , LC
) W3 , 가 ,

6 , LC W3 14 μ m 85% 가
 , W3 12 μ m 90% (92b) , , 90%
 85% , 20b

13 VGA LCD , LCD 25 가
 , LCD 7a 7b LCD 14a 14c 13 VGA LCD(OS
 LCD LCD) , , 85% 90% 가

7a 7b , x , LCD (' ') , y
 OS , LCD . LCD 가 , 가
 , OS , 5 , 15 , 25 40 0 32 (32
 0 64 0) 7a ,)
 7b 64 7a 7b (64 0 (○, , X) 가 . 가
 , 20b (92b) 가 가
 , , X

7a 7b , 85% 가 ○ , 가 40
 90% , LCD , 0 32 (7a), 가 40
 80% X 가 가 , LCD , 0 32
 (7a), 가 5 85% , 가 25
 90% 0 64 (7b), 가 5 90%

LC , LC W3 14 μ m 85% , 가 ,
 W3 12 μ m 90% . 가

가 OS 가 MVA LCD

가 12 (3 , 15 μm : 15 37) MVA LCD (1c MVA LCD
, LC W3 27 μm W2 7 μm (1 W1 7 μm 15
 μm 6) OS LCD 가 . ()
W3 8 4 .

8 , 3 W3 3 R3 4
, 가 R3 (21) (22) , (13A) ,

, 3 R3 R3 32 OS , 0
가 LCD , 4 가 OS (OSV32) 가 1 W3
R3 LCD 가 8 , 8 25 5 3

8 R2 W3 R3 1 R1 2
- R2 가 3 R3 (13A) , R3 = W3 - R1
, 3 R3 () , 3 R3
, 3 R3 (13A)

8 , 25 , 3 W3가 12 μm 3 R3
(bottom transmittance) 90% 가 R3가 W3 , 6

8 5 (,) W3가 8 μm , 3 R3
, W3가 8 μm

9 6 3 R3 9
3 R3 2 μm , 85% 가 , R3
0 μm 90% .

, W3 OS
(horn response)(5a 5b) , 85% 가
가 LCD가 ,

2 μm , W3 LCD W1 W2 4 μm , W3 2 μm
, LCD OS OS
, V0 , OS 32 (, 32 OS
(interpolation) 가 OS , 32 OS
, 2 OS 가 .
, 1 OS 32 OS OS

OS, W3 14 μ m MVA LCD

MVA LCD, 2 3
W3, ((- -)/)
W3) 107) 1(
가, 가 1
(, 가
).
2 3 LCD, 1 2 (21 22)
(, (13A) W3) (13A) 1
(,), W3가
(13A) 1 (13A) W
3가
MVA LCD, W3
가 (, ' ') W3
0 1
6 가 LCD
10a 10b 10a 10b x (W3/ W2) (W2/
d) 10c LCD
10a, (W3/ W2) 1.5 (d)
0.7) 3 0.7, 10b W2/)
W3, 10a 11
11, (13A) (22) (13a)가
(13A) (13a) (13A) () (major side) (13X)
(tilt electric field) (13X)
(13X) (13A) () (minor side) (13Y) (13a)
(13A) (13Y) (13X) (13a) (22)
(13A) (13A) (13a) (13a)
(13A) W3 (22) (, (/)), (13A)
(13a) (13a) (13a) W3 (13
A) 가 (13a) 가 W3
W3 () ,
d가 3 μ m
d가 (22)
(12)
(13A) (13a) d가
가
LCD, 2
(52) (52) (12) 12a 12b

(13a) (52) .

12a 3.5 μ m (52) LCD (52) (51) 1.5 μ m . (12) (13a) 12a (12) (11) (12) (51) .

(52')(12) nm SiO₂ (52') 12b (12) (51) (13a) 12b (12) (13a) (51) .

12a 12b LCD (13a)가 / (13a) (52) 가 .

1 2 (21) (22) (22) (22) (13) (22) .

LCD LCD (13) d 3 μ m (5a 5b 가 가 MVA) .

13a 13b (13) d .

13a (turnaround time) OS 가(O ms) , 1 (16.7 ms) (16.7 ms) 99 % 32 0 .

13a W3 14 μ m 100 ms d 3 μ m .

13 VGA LCD W3 10.7 μ m 4 d 3.4 μ m, LCD(100) W3 15.4 μ m LCD 가 .

14a 14c LCD LCD 가 O 32 (14a), 0 64 (1 4b), 0 96 (14c) LCD

LCD , 가 5 .

14a 14c , LCD ,

80% LCD , OS LCD OS

(dark belt)가 , LCD OS

1 6 , LCD LCD , OS

1 6 , (start) , (end)

OS (,) , LCD 1 , LCD

4 , OS 94 , 1 , 0 32 4

OS , 1 4 15 ,

2 3 LCD , OS OS OS

OS 가 , 5 6 LCD , OS

가 0% 100% , 10% 90%

(: msec)

1 4 , 32 , 1 OS

OS (OSV32) V94(94 1 , 0 32

V32 V94 가 LCD , 4 , 0 32

OS (OSV32) V156(156) LCD LCD

OS (, 2 5 , LCD

2 , LCD OS

1 (16.7 msec) , OS

3 , 1 LCD OS , 6

1 LCD OS 가 ,

[1]

OS 양

end

	0	32	64	96	128	160	192	224	255
0	0	94	136	179	198	212	228	248	255

[2]

(OS 없음, 10-90%)

end

	0	32	64	96	128	160	192	224	255
0		99.5	69.6	57.5	43.5	34.8	27.1	16.6	15.5

[3]

(OS 있음, 10-90%)

end

	0	32	64	96	128	160	192	224	255
0		11.5	10.3	10.6	10.2	10.3	10.0	8.3	15.5

[4]

OS 양

end

	0	32	64	96	128	160	192	224	255
0	0	156	199	226	240	255	255	255	255

[5]

(OS 없음, 10-90%)

end

	0	32	64	96	128	160	192	224	255
0		212.7	43.6	94.9	69.3	48.7	35.4	26.1	28.1

[6]

(OS 있음, 10-90%)

end

	0	32	64	96	128	160	192	224	255
0		11.6	9.4	9.0	9.4	14.5	29.2	33.8	28.1

가 LCD , OS , LCD 가가 LCD , OS OS (가) 가 OS OS

가 , OS 가 (, V0→V94→V32 OS 가)가

MVA LCD () (2) 가 (1) LCD 가 16 CPA(con tinuous pinwheel alignment) LCD

16 (200a) CPA LCD (32)(: (32)
(32) (42), (32)
() () (41) CPA LCD (41)
(41) (42) 2 (32) (42)
) 1 (42) 2 (32) (42)
CPA LCD 16 (41) 1 W1 ,
(42) 2 W2 (41) (42) (32) ,
W3 MVA LCD CPA LCD W3가 가 ()
CPA LCD W3가 가
(MVA LCD CPA LCD , 1 (,) 2
(,) ()
, 17 MVA LCD ,
17 (300a) MVA LCD (72), (72)
(62), (72) (72)
() (61) MVA LCD W1
(62) (62) (62a), (62a)
(62b) (61) (62a)
W3 (62) (62b)
(62) 2002-
107730 (62) (62) 가
(62) (62) (61) (62)
3 (62) (62) (62a) 가
(300a) MVA LCD W1, W2 W3 LCD
, 16 CPA LCD 가
OS LCD (,
W3) , 6 ,
W3 , 1.2 V
, 18 19 W3
, LCD 7 LCD 7.6 V 18 19 25 (,
) LCD , 32 18 0 32
OS 가
, 64 19 0 64 100%
y 1 133 mPa · s v 가 19 mm²/s 가 (d× ,
Δn) 300 nm

[7]

액정 영역 폭 W3 (μm)	리브 피치 P (μm)	리브 폭 W1 (μm)	슬릿 폭 W2 (μm)	리브 높이 (μm)	액정층 두께 d (μm)
20	58	8	10	0.7	2.8
17	52	8	10	0.7	2.9
14	46	8	10	0.7	2.8
11	40	8	10	0.7	2.8
8	34	8	10	0.7	2.9

18, 19, W3

μm LCD, 0V, 0.5V, 1.0V 1.6V 657, 613, 573 W3 11 539

18, W3 14μm, 0V, 80%

가, 가, 19, 85%

μm, 18, 85%

19, 90% W3 12

가 LCD

LCD, MVA LCD CPA LCD, 가가 LCD가

가가 LCD가 LCD, TV OS 가

(57)

1. 1, 2, 1, 2
- 1, 1, 1;
- 2, 2, 2;
- 1, 2, 3
- 3, 2μm, 14μm

2.
1 ,
1 1 (stripe) , 2 2
3
3.
1 ,
3 12 μ m .
4.
3 ,
3 8 μ m .
5.
1 , 1 2 , 1 2
1 ,
1 , 1 1 ;
2 , 2 2 ;
1 2 , 3
1 ,
1 2 1 1 ; 2 2
2 2 3 1 3 ,
cale) 3 , 1 (black display) 32/255 (grays
가 1 2 μ m .
6.
5 ,
1 1 , 2 2
3
7.
5 ,
1 16.7 msec .
8.
5 ,
3 2 μ m 14 μ m .
9.
8 ,
3 12 μ m .

- 9

10.

,
3 8 μ m .
- 1

11.

,
1 (rib) , 2 2
.
- 11

12.

,
1 4 μ m 20 μ m , 2 4 μ m 20 μ m .
- 1

13.

,
1 , 2 .
- 1

14.

,
3 μ m .
- 14

15.

,
2 / 3 .
- 14

16.

,
3 / 2 1.5 .
- 1

17.

,

45 ° , 1 2 .
- 1

18.

,

(overshoot) 가
.
19.

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

1

2

3

3 2μm 14μm

3μm

20.

1

가

21.

20

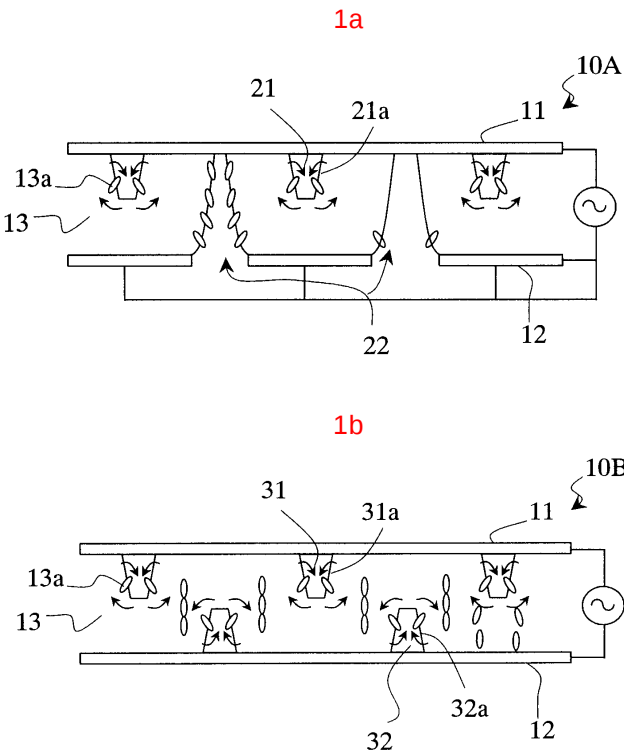
가 1

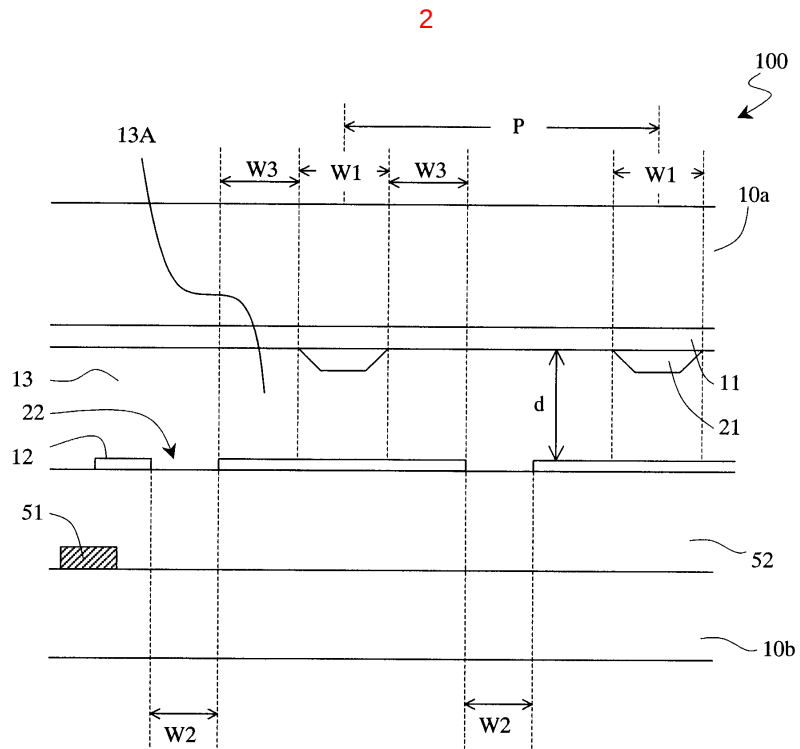
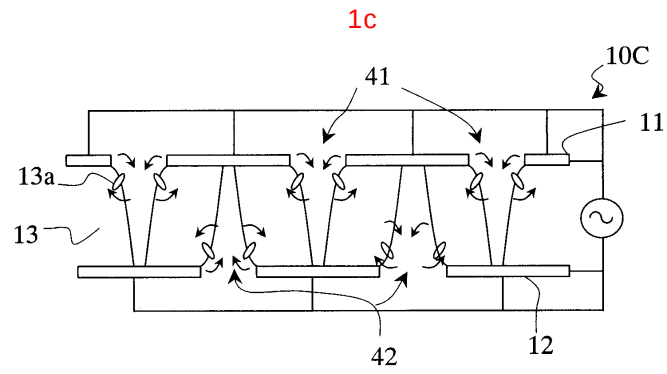
22.

1

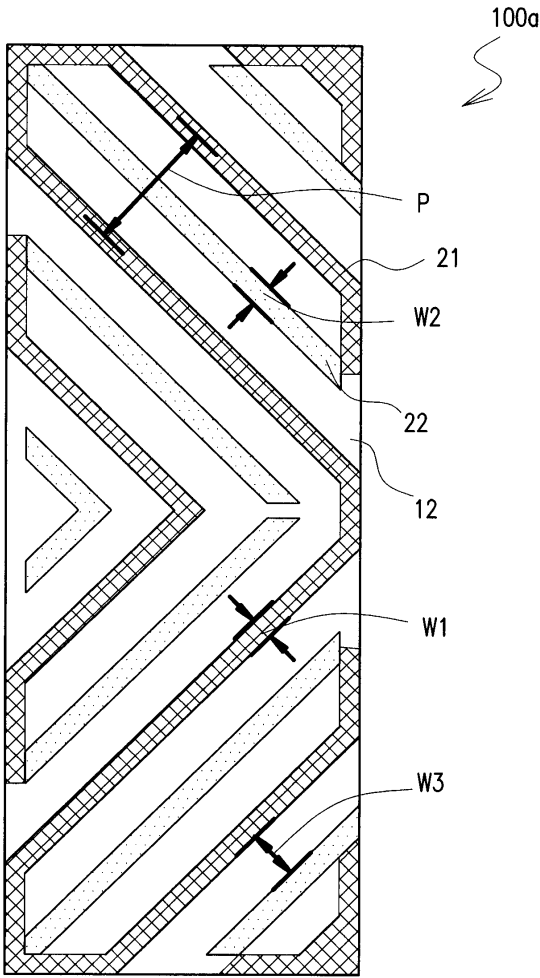
23.

22

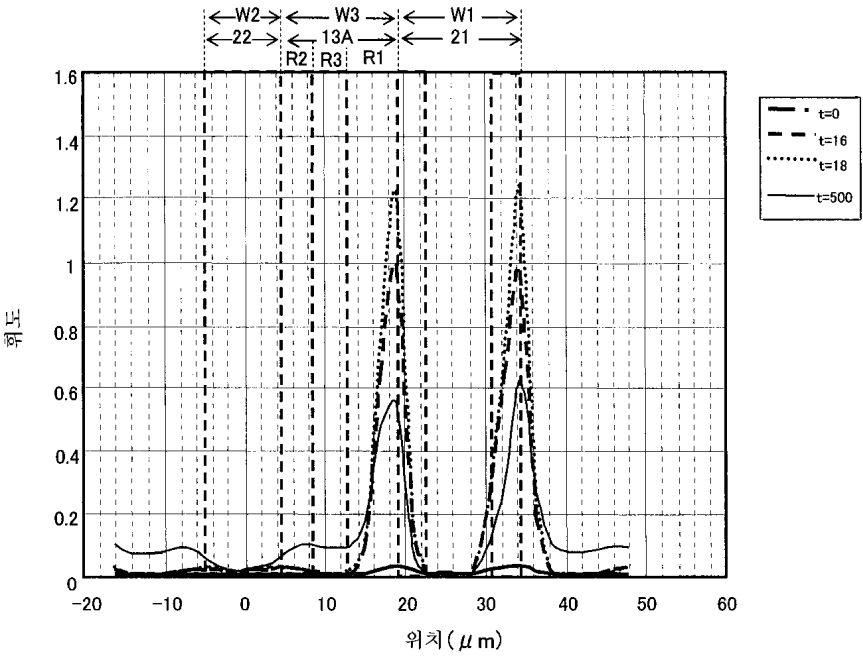




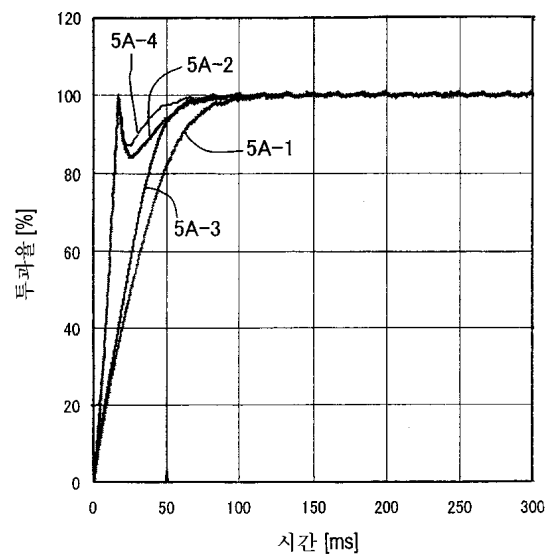
3



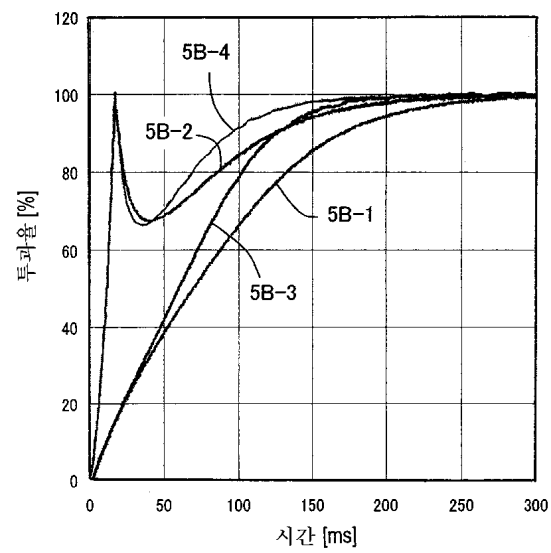
4



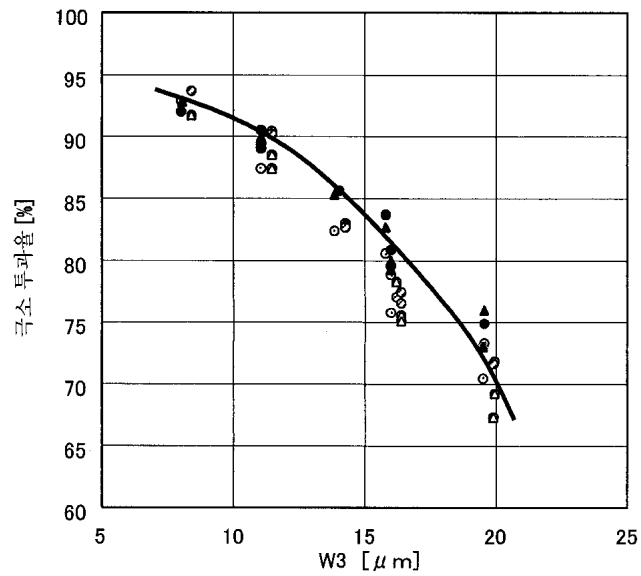
5a



5b

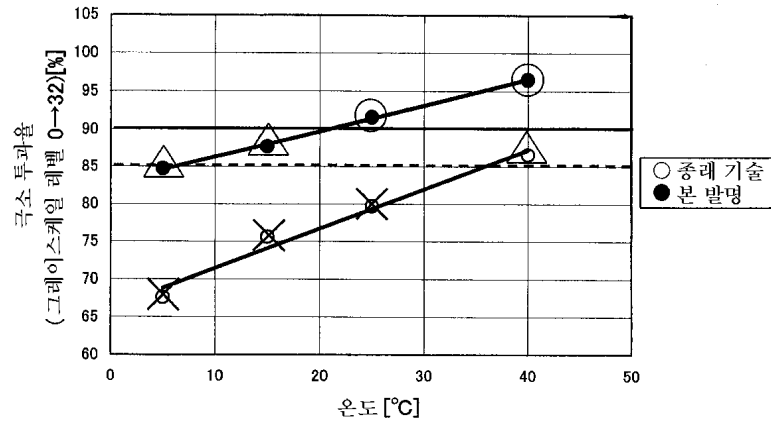


6

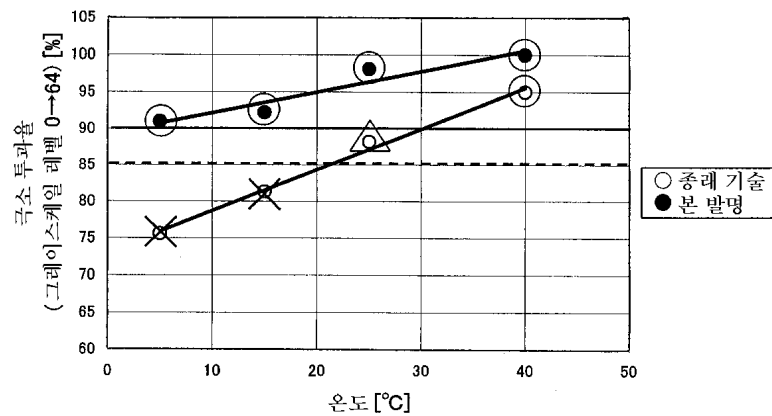


○ LC-A	d=3.9 μm	RIB=1.35 μm
● LC-B	d=2.8 μm	RIB=1.35 μm
▲ LC-C	d=2.8 μm	RIB=1.35 μm
○ LC-B	d=2.8 μm	RIB=0.7 μm
△ LC-C	d=2.8 μm	RIB=0.7 μm
○ LC-D	d=2.3 μm	RIB=0.7 μm

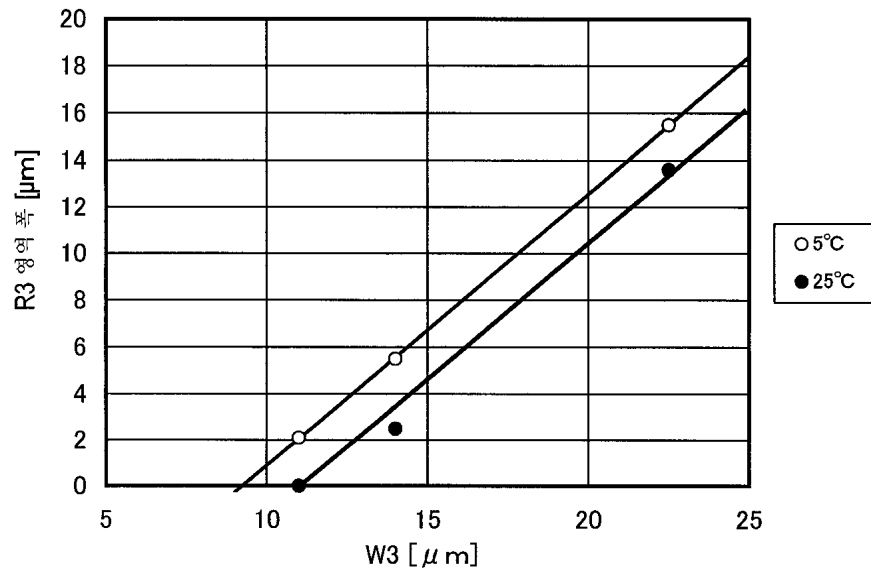
7a



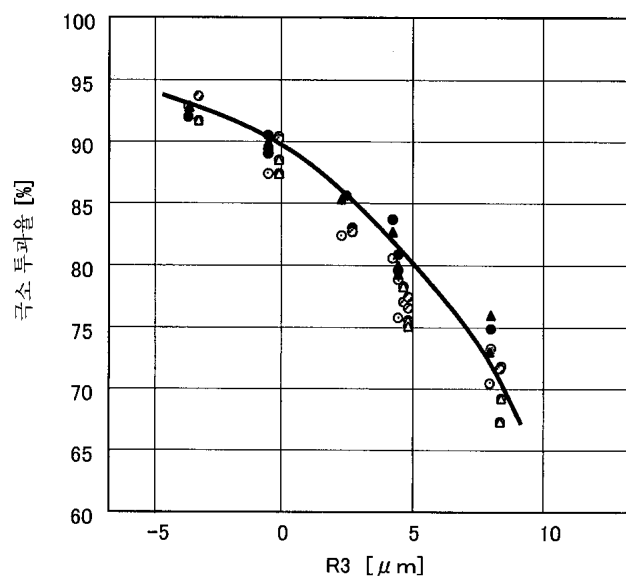
7b



8

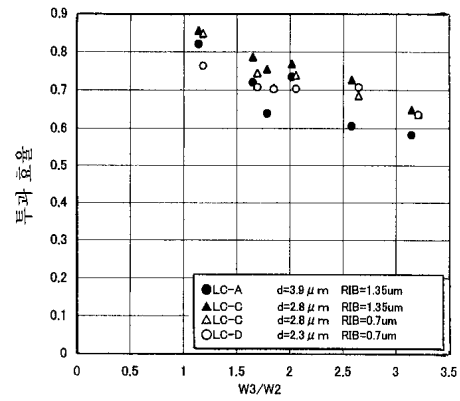


9

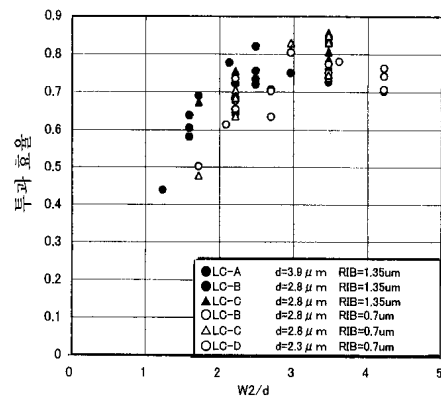


○ LC-A	$d=3.9\mu\text{m}$	$RIB=1.35\mu\text{m}$
● LC-B	$d=2.8\mu\text{m}$	$RIB=1.35\mu\text{m}$
▲ LC-C	$d=2.8\mu\text{m}$	$RIB=1.35\mu\text{m}$
○ LC-B	$d=2.8\mu\text{m}$	$RIB=0.7\mu\text{m}$
▲ LC-C	$d=2.8\mu\text{m}$	$RIB=0.7\mu\text{m}$
○ LC-D	$d=2.3\mu\text{m}$	$RIB=0.7\mu\text{m}$

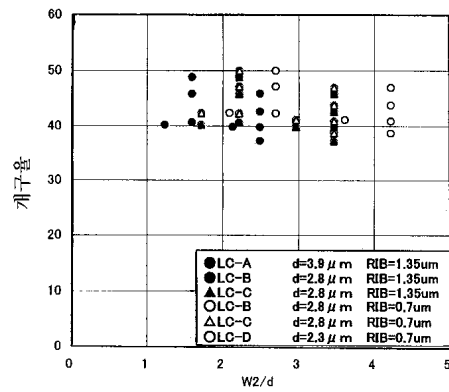
10a

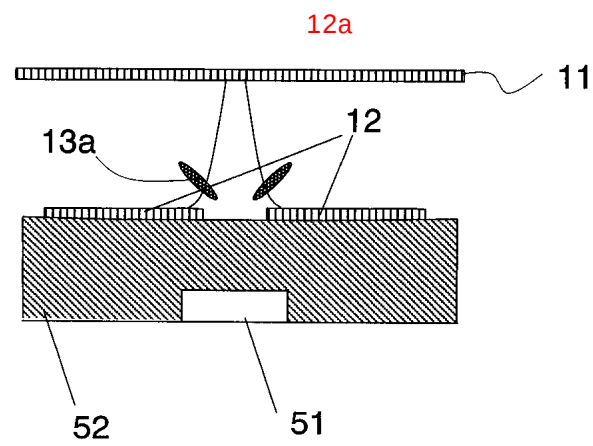
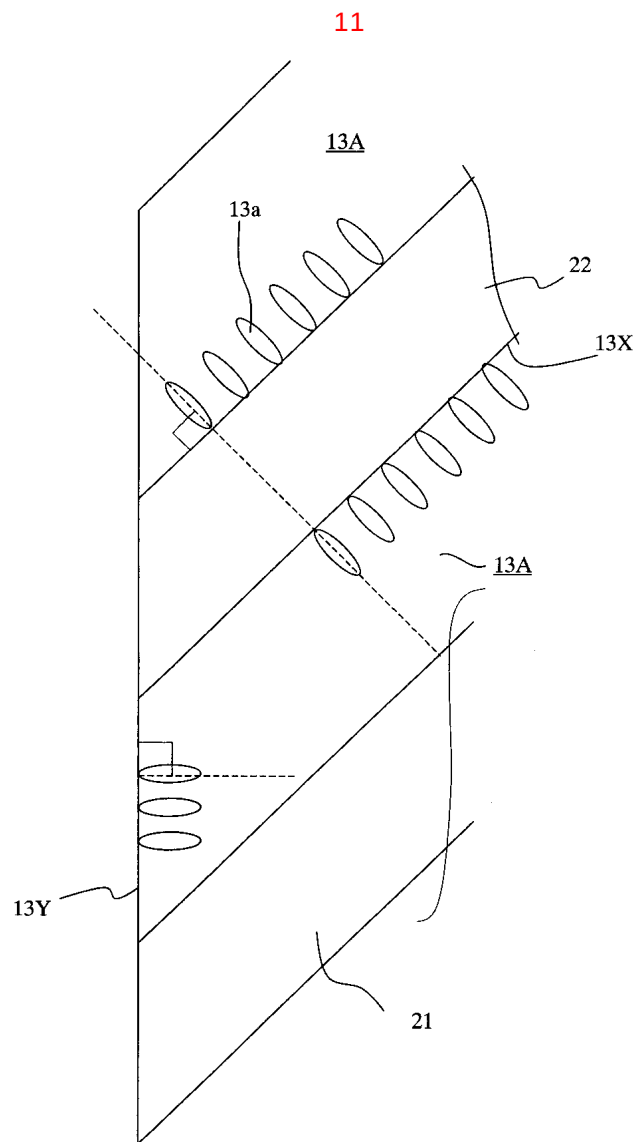


10b

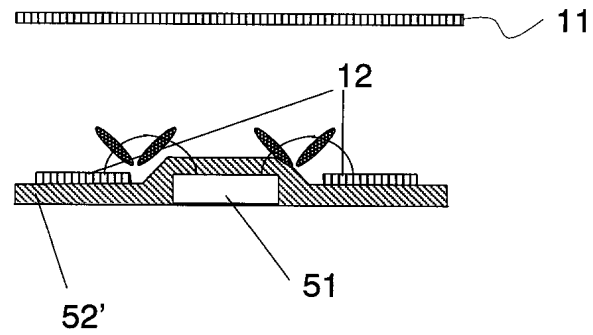


10c

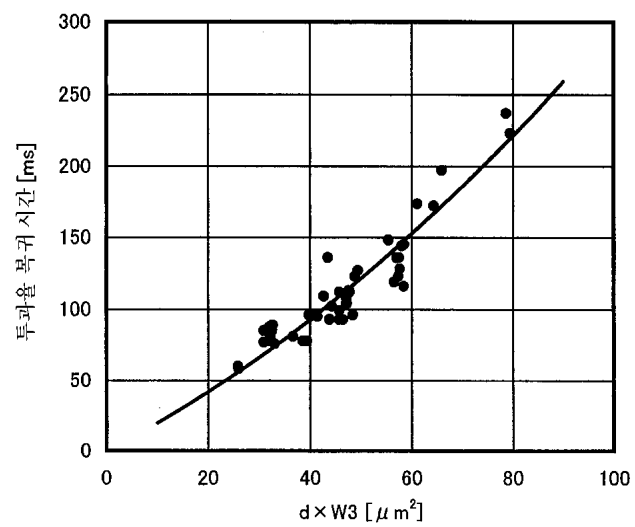




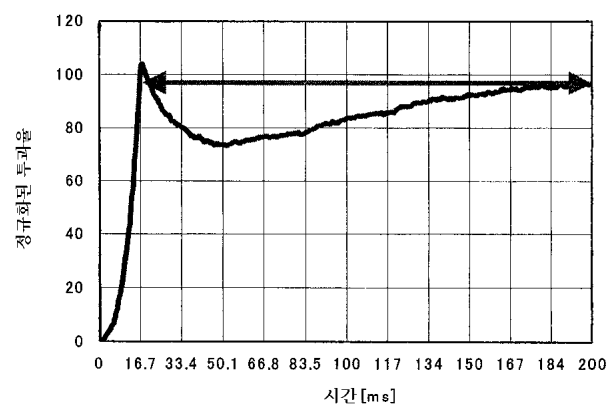
12b

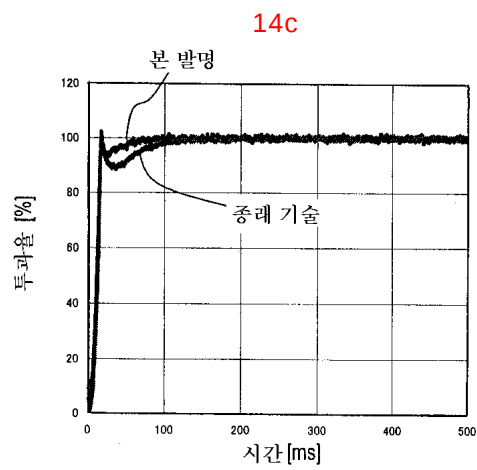
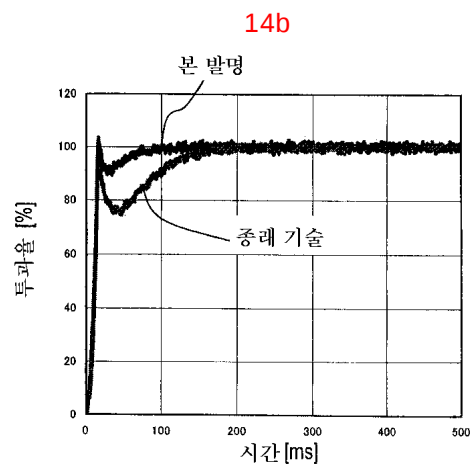
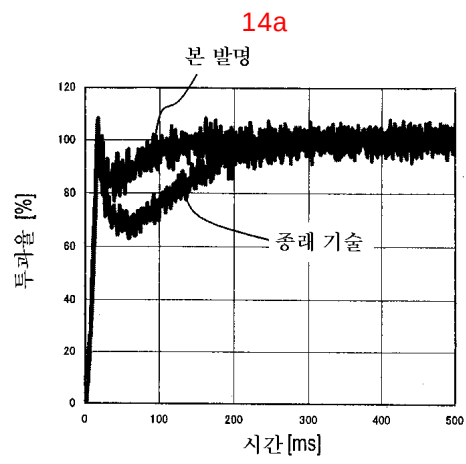


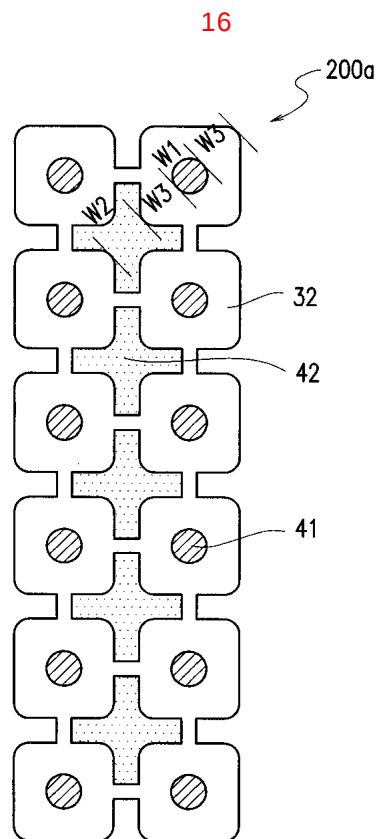
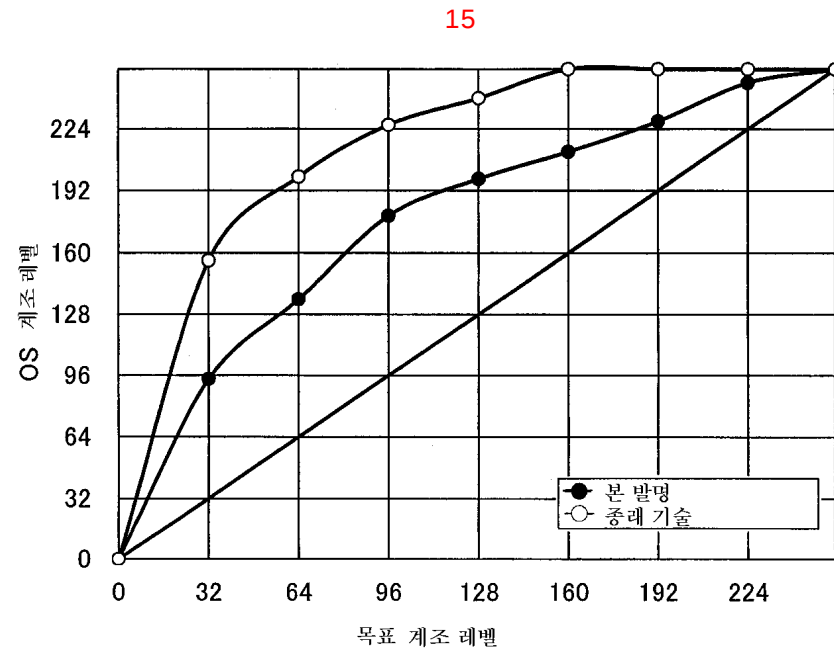
13a



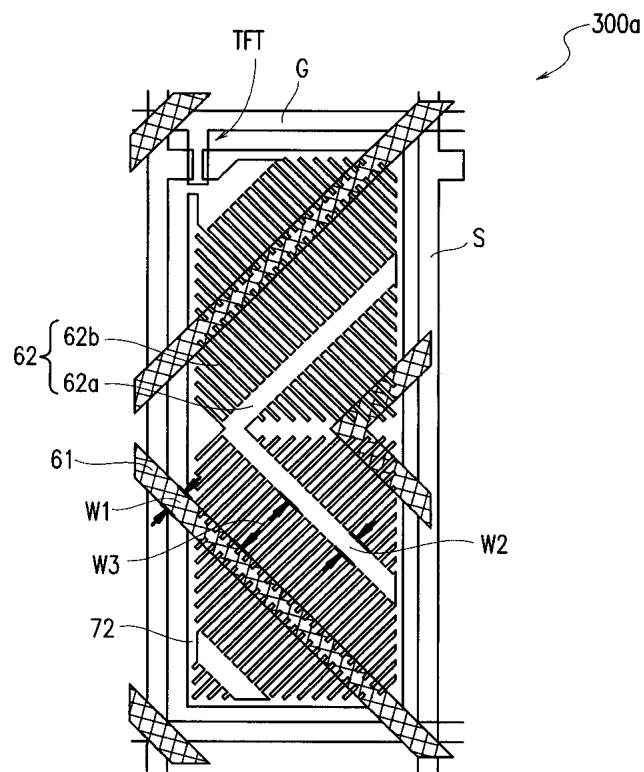
13b



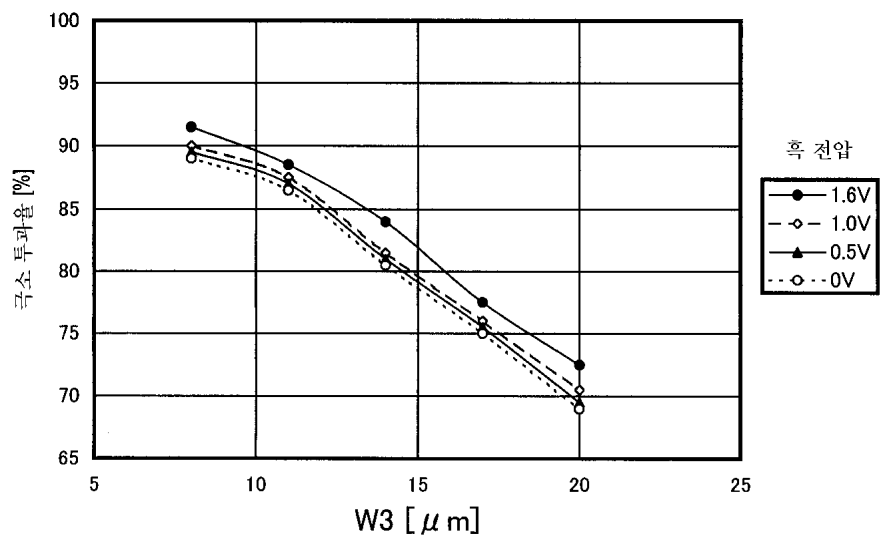




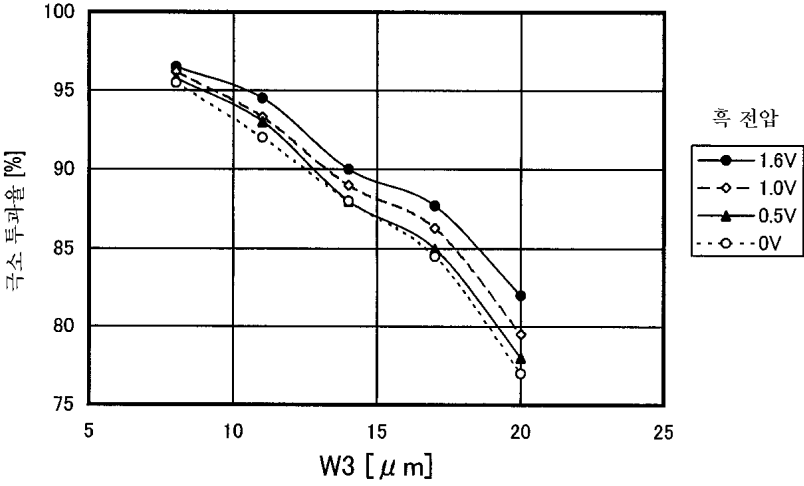
17



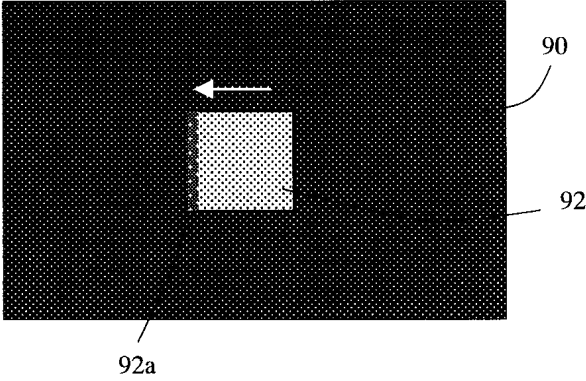
18



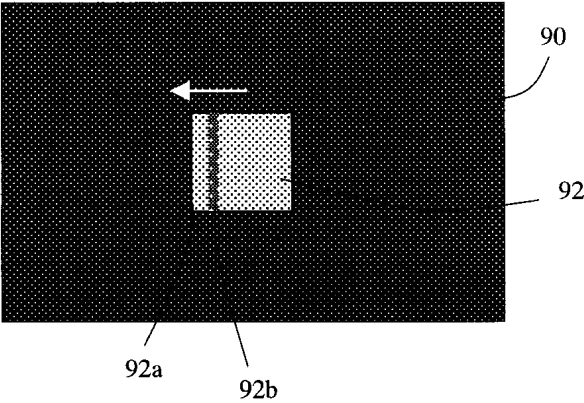
19



20a



20b



专利名称(译)	液晶显示器及其驱动方法		
公开(公告)号	KR1020050012178A	公开(公告)日	2005-01-31
申请号	KR1020040057658	申请日	2004-07-23
[标]申请(专利权)人(译)	夏普株式会社		
申请(专利权)人(译)	夏普株式会社		
当前申请(专利权)人(译)	夏普株式会社		
[标]发明人	KUBO MASUMI 구보마스미 YAMAMOTO AKIHIRO 야마모토아끼히로 OHGAMI HIROYUKI 오가미히로유키 OCHI TAKASHI 오찌다까시		
发明人	구보마스미 야마모토아끼히로 오가미히로유키 오찌다까시		
IPC分类号	G02F1/1335 G02F1/133 G02F1/139 G09G3/20 G02F1/1337 G02F1/1333 G09G3/36		
CPC分类号	G02F1/133707 G02F1/133753 G02F2001/133776 G02F1/1393		
代理人(译)	CHANG, SOO KIL		
优先权	2003279083 2003-07-24 JP 2004205103 2004-07-12 JP		
其他公开文献	KR100680102B1		
外部链接	Espacenet		

摘要(译)

一种对准分割垂直对准型液晶显示装置，当应用OS驱动方法时能够进行高清晰度运动图像显示。本发明的装置包括多个液晶显示元件，每个液晶显示元件具有第一电极（11），面向第一电极的第二电极（12），以及设置在第一电极和第二电极之间的垂直取向液晶层（13）和像素。该装置包括：第一对准控制装置，设置在液晶层的第一电极侧上并具有第一宽度W1；第二对准控制装置设置在液晶层的第二电极侧并具有第二宽度W2；并且，液晶区域限定在第一对准调节装置和第二对准调节装置之间并具有第三宽度。第三宽度W3在2和14之间的范围内。2 指数方面 液晶显示器，电极，垂直排列的液晶层，像素，

