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(71) 가 가
가 가 398

(72) 가 398가 가 ()
가 398가 가 ()

(74)
:

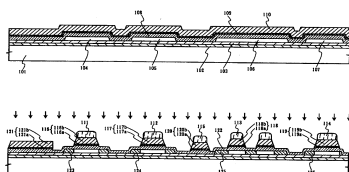
(54)

(pixel)

TFT

(photo mask)

1,	2,	3	1	1	3	1	3	1	
, 1	3	1	1,	2,	3	2	1,	2,	3
1	1,	2,	3	2	2	2	2	2	2
	3			3		3	1	2	
	4	5							



1a	1b	TFT	.
2a	2b	TFT	.
3a	3b	TFT	.
4		TFT	.
5		(active matrix)	(pixel)
6			.
7a	7b	TFT	.
8a	8b	TFT	.
9a	9b	TFT	.
10		TFT	.
11a	11b		.
12			.
13			.
14			.
15			.
16a	16e		.
17a	17c		.
18			.
19a	19b	NMOS	.
20a	20b		.
21	n-	TFT	.

22

23 n- TFT

24 p- TFT

25

26 p- TFT

27a 27f

28a 28c

29

30

31 (fitting)

*

*

101 : 102, 103 : 1

104 107 : 108, 122 : 2

111 114 :

116 118 : 1

tor)) , (TFT(thin film transis

el display)) 가 , CRT fot (flat pan

가 TFT가 (pixel) (dot) 가 (active matrix) . TFT

TFT . TFT가 , TAB(tape automated bonding)
 COG(chip on glass) IC(IC)가

IC , RGB , UXGA (1200 x 1600) (pitch)가
 6000 가 (가) 가 , 가
 가 , 가

(ON : I_{on}) (hot carrier)
 OFF (I_{off})가 . LDD(lightly doped drain)
 OFF TFT . LDD , LDD

ON (degradation) LDD (- LDD; GOLD(gate - drain overlapped LDD))
 LDD

TFT (photo mask) TFT 가
 가 , 가 가 . 가

(photo mask)
 TFT

2- (self - aligning manner) LDD 1 2 n- TFT -
 TFT n- TFT LDD (LDD 2) . n- TFT LDD
 2가 LDD 2 .

1 1 3 ;
 1 , 2 , 3 , 1 , 2 ; 1 ,
 2 , 3 , 1 , ;
 1 3 1 1 1
 1 3 ;

1 1 3 2 1 3 ;
 2 2 2 2 , 1 2 2
 3 3 4 5 ,
 TFT 가 LDD
 ;

1 1 1 , 2 , 3 ; 1
 2 1 1 ; 1 1
 2 1 1 2 3 ; 2 2
 3 2 1 2 3 ; 2 2
 2 2 1 2 3 ; 2 2
 3 ; 3 3 4 5 2 2 ,

LDD () LDD n- TFT -
 n- TFT LDD

, TFT
)가 (, ,

1

1a 6 TFT(n- TFT p- TFT) 가 TFT 가

1a (101) , , 가

(101) 가 (102, 103) 1 2-
 (104 107) 1

(deposition) ,
 (Si_xGe_{1-x} ; 0 < x < 1, x = 0.001 0.05)

가 KrF (excimer), ArF, XeCl, Cr, Nd, Er, Ho, Ce, Co, T
 i, Tm, YAG, YVO₄, YLF, YAIO₃ 가
 1μm 2μm, 가
 onic) 4, (: 1064nm) 2 (532nm) Nd:YVO₄ 2 (harm
 on) 가 (krypt
 1, YVO₄, YLF 가 (550 4). (dehydrate)(500 YAG
 2 (108) (104 107) 2 (108)
 (plasma) CVD (sputtering) 40 150nm
 (104 107) 2 TFT
 2 (108) 2
 1 (109) 2
 2 (108) 1 (110) 2
 Mo, Ta, Ti, Al, Cu, W, Mo, Ta, Ti W,
 n
 1b (resist mask)(111 114) 1 2
 1 116 118) 1 (114, 115) 45 75° (tapered) 1 (
 (116 118) 1 (114, 115) 2 (122) 20
 50nm
 1 (116 118) (104 107) 1 (123 126) 1
 1 x 10¹⁷ 1 x 10¹⁹ atoms/cm³
 (111 114) 2 가 2a
 (anisotropic etching) 2 (127 129) 2
 (130, 131) 2 (127 129) 2 (130, 131)
 2 20 50nm
 (104) (133), (106) 2 (129)
 (134), (107) (134)가 2 2
 (105) 3 (105, 1
 06)

(128a) 2 (135) 2 (128) 1 (128a) 1
 (128a) (135) 가 3 n 3
 (136, 137) 1×10^{20} 1×10^{21} atoms/cm³ 1×10^{16} 1×10^{17} atoms/cm³
 3a (138)가 3 (104)
 3 () 4 (139)
 5 (140) 4 (127)
 , 1×10^{18} 1×10^{19} atoms/cm³
 LDD 5 (140) 2×10^{20} 3×10^{21} atoms/cm³
 가 (valence electron)
 2 (127 129) 2 (130)
 2 (131)
 3 (143) CVD 3 (143)
 3b (rapid thermal annealing; RTA) (400 (532nm)
 furnace annealing) 700 , 450 500 , YAG 2 (532nm)
 532nm) 가 RTA가 YAG 2
 4 (144) 50 100nm
 CVD 410
 5 (145) 4 (144) 5 (contact hole)
 (146 149), (151), (152), (150),
 (153)
 n () p , p- TFT(200) 1 n- TFT(201)
 (205) , 2 n- TFT(203) (204) (206)
 (130) (204) (107), 2 (122), 1
 (205) p- TFT(200) (154), 2 (127)
 5 p (140)((140)), 2 (127)
 4 p (LDD)

1 n- TFT(201) (155), 2 (128)
 2 n (124)(LDD), 3 n (13
 5) LDD 0.5 2.5 μ m, 1.5 μ m LDD (h
 ot carrier) TFT p- TFT
 1 n- TFT(201)

(206) 2 n- TFT(203) (156), 2 (1
 129) 1 n (125), 3 n (14
 (136) (107) (204) p (14
 1, 142)

(206) (151) (106) 3 n (136) (131)
 (150) (152) 2
 (129)

LDD 1 n-
 2 n- TFT 가
 TFT, LDD가 TFT
 , TFT p- TFT , LDD , TFT

(205) (206) (active m
 atrix) 가 ,
 가

2

7a 10 TFT
 TFT(n- TFT p- TFT)

1 (304 307), 2 (308), 1 (309), 2 7a (301), 1 (302, 303),
 (310)

7b (311, 312)가 (311) (312)
 (313) 1 (314, 315) 1 (313a) 2 (313b)
 , (314) 1 (314a) 2 (314b) , (315) 1 (315
 a) 2 (315b)). (306, 307) 1 (316, 360)

가 8a (311, 312) , 1 (313) 1 (314, 315) (317)
 (321 323) (318 320) 2 1

1 2 1 2 , 45 75 °

2 8b 3 3 2 (324
 326) 2 2 1 (324a
 326a)

2 (324, 325) 1 (324a, 325a) 2 (324b, 325b)
 2 (304, 305)
 2 (330, 331) 2
 3 (327, 328) 2 3 (32
 9) (306)

(332, 333) 3 (304) 9a
 (334) 5 4 (335) 5
 (336) (307)

, 3 (337) 1

4 (338) 10 410 가
 5 (339) 4 (338) 5
 3 5
 (340 343), (345), (346), (344, 347)

n () p , p- TFT(400) 1 n- TFT(401)
 (405) 2 n- TFT(403) (404) (406)
 (314) (404) (307), 1 (361), 1

(405) p- TFT(400) (348), 2 (324)
 4 (332), 2 (324)
 5 (333)

1 n- TFT(401) (349), 2 (325)
 2 (LDD) (331),
 3 (328) LDD 0.5 2.5μm, 1.5μm L
 DD TFT . n- TFT p- TFT
 (401) , , , 1 n- TFT

313) (406) 2 n- TFT(403) (350), 1 (

3 (329) 1 (316), (404)

5 (336) (307)

LDD LDD TFT

가 - LDD

1

가 1a 6 TFT TFT p- TFT) TFT

1a (alumino borosilicate glass)가 (101) 1

50nm 1 (102) 100nm 2 (103)

(102) SiH₄, NH₃, N₂O (103) SiH₄ N₂O

(104 107) 1 50nm

(deposition) 300 mJ/cm² , 90 98%

500μm

YVO₄ 가 2 , 1

0W 1 100 cm/sec

TFT (acceptor)

110nm SiH₄ N₂O (island) (104 107)

108) CVD 2 (108) 1 (109)

, 300nm 30nm 2 (110) 2 1 (109)

n 가 15nm 45nm (

) 30 가 90keV 가 31 (

) 31 , 2.4 2.66 가

15nm 300nm 30 31

(111) (114)가 1b , 1 (109)
 2 (110) 1 가 ICP(inductively coupled plasma)
 , CF₄, Cl₂, O₂가 W
 25:25:10 , 1 Pa 500W RF(13.56MHz)
 , () 가 150W RF(13.56MHz)
 1 , , W
 , 가 CF₄ Cl₂ 30:30 , 500 W RF(13.56MHz)
 1 Pa 가 30 ()
 W 가 20W RF(13.56MHz) . CF₄ Cl₂
 (114, 115) 45 75 ° 1 (116 118) 1
 , 10 20% . 2 (116 118) 1
 (114, 115) 2 (122) 20 50nm
 1 , 1 (116 118)
 (104 107) 1 n (PH₃) (noble gas) 가
 n 1 x 10¹⁷ 1 x 10¹⁹ atoms/cm³ (123 126) 1
 (111 114) , 2a 2 가 . CF₄, Cl₂,
 O₂가 , 20:20:20 , 500 W RF(13.56MHz) 1 Pa
 - 가 20 W RF(13.56MHz) () 1 , 2
 W W 가 2 (127 129) 2
 (130, 131) 2 (127 129) 2 (130, 131)
 2 20 50nm
 , 2 (104) (133), (106) 2
 (129) (134), (107) (134)가 . 2 , 2
 n (105) , 3 n (105, 106)
 , (dose) 1.5 x 10¹⁴ atoms/cm³ , 가 100keV
 2 n (135) 2 (128) 1 (128a)
 - . 1 (128a)
 1 x 10¹⁶ 2 3 n (135)
 2¹ atoms/cm³ 1 x 10¹⁷ atoms/cm³ . 3 (136, 137) 1 x 10²⁰ 1 x 10
 , (138)가 3a 3 , ,
 (diborane)B₂H₆ (noble gas) 가 (104) 4 p
 (139) 5 p (140) . 4 p 2
 (127) , 1 x 10¹⁸ 1 x 10²⁰ atoms/cm³ . 5
 (140) 2 x 10²⁰ 3 x 10²¹ atoms/cm³ . 5 p (1
 42) 4 p (141) (107)
 , 2 (127)
 129) . 2 (130)
 . 2 (131)

50nm CVD 3 (143)
 3b YAG 2 (532nm)

4 (144) 50nm CVD
 410 가

5 (145) 4 (144)
 3 5 (146)
 149), (151), (152), (150), (153)

p- TFT(200) 1 n- TFT(201) (205) 2 n-
 TFT(203) (204) (206) (204) (107),
 2 (122) 1 (130)

(205) p- TFT(200) (154), 2 (127)
 5 p (140)((140)), 2 (12
 7) 4 p

1 n- TFT(201) (155), 2 (128)
 2 n (124)(LDD), 3 n (13
 5) LDD 0.5 2.5 μ m, 1.5 μ m LDD
 TFT n- TFT p- TFT
 1 n- TFT(201)

(206) 2 n- TFT(203) (156), 2 ((1
 129) 1 n (125), 3 n
 (136) (107) (204) p (1
 41, 142)

(206) (106) 3 n (136) (131) (15
 0) (151) , 2
 (129) (152)

(206) 5 5 (dot) , 4
 5 A - A' 4 5
 (light - shielding film) 가
 (gap)
 (black matrix))
 (aperture ratio)

LDD n- TFT LDD 가 n- TFT TFT
 , TFT
 p- TFT

6 (601), (602), (606) 6 TFT

(602) (603), (604, 605), (601)

(606) 가 XGA , 1024 x 768 가

가 , 가

2

7a 10 TFT TFT p- TFT TFT

(302, 303), (304) (307), 2 (308), 1 (309), 2 (301), 1 (310)

7b (311, 312)가 (311) (312)

(314, 315) (313) 1 (314) 1

(314a) 2 (314b) (313a) 2 (313b) (315) 1 (315a) 2 (315b)

(316, 360) 1 1 (306, 307) 1 n

1×10^{17} 1×10^{19} atoms/cm³ 1 n

(311, 312) 1 (313) 1 (314, 315) (317)

가 8a (318) 320) 2 (317) 1

(321) 323) 2 1

2 8b 3 3 2 W

326) 3 (324a) 326a) 2 (324) 1

2 (324, 325) 1 (324a, 325a) 2 (324b, 325b)

(304, 305) n

가 100 keV 1 5% PH₃ 2 n 1.6×10^{14} atoms/cm³ n

(327, 328) 가 2 n (330, 331) 3 n

n (327, 328) 2 1×10^{16} 1×10^{17} atoms/cm³ 1 3

3 (329) (306) , 1×10^{20} 1×10^{21} atoms/cm

3 (304) (332, 333)가 9a

p (336) (307) 4 p (335) 5 p (334) 5

가 1 3 (337) , 4 (338) 10 410 5 (339) 4 (338) (340 343), (345), (346), (344, 347)

2 , p- TFT(400) 1 n- TFT(401) (405) 2 n- TFT(403) (404) (406) (307), (361) , 1 (314)

5 (405) p- TFT(400) (348), 2 (324) 4 (332), 2 (324) (333)

D 1 n- TFT(401) (349), 2 (325) 2 (LDD)(331), LDD 0.5 2.5 μ m, 1.5 μ m LD (328) , , TFT , 1 n- TFT p- TFT (406) 2 n TFT(403) (350), 1 (3) 3 (329) 1 (316), 5 (336) (404) (307)

가 - , LDD LDD TFT

3

11a 11a 11b 11b 2 (406) 2 n- TFT(403) (404) 2

11a 4 (338) 5 (339) 5 (339) (370) 100nm (371)

(372) 11b (370) (373, 374) (375) 100nm 300nm (375)

1

4

3
12

11b (rubbing treatment)가 (oriented film)(383)
(383)
(columnar spacer)가
가

(380) (381) (382) 가
(381) ITO (382) 가
(sealing agent)()
가 (385)가
가 (385)

3 12 가
1 2

5

13
(450) n- TFT(203) p- TFT(200) 1 5 (501)
가

(450) (502) n- TFT(203) (503) n-
TFT(203) p- TFT(200) (505)
(504) (451)

(451) ITO (506)

100nm ITO

508 (polyimide), 1 5nm (508) (polyamide), (acrylic) (
(polyimideamide),

(510) MgAg LiF (earth metal)
 (509)

(509) (510) ()
 (506) (501) (partition wall layer) (507)
 (506) (507) 가 , 1
 2μm (507) 가 ,

(510) (Mg), (Li), (Ca) 가
 MgAg(Mg : Ag = 10 : 1 Mg Ag) (510)
 가 MgAgAl , LiAl , LiFAl ,
 DLC (511) 2 30nm, 5 10nm . DLC CV
 D , 100 (507) . DLC
 (stress) , . DLC
 (51) CO, CO₂, H₂O (gas barrier) ,

13 , n - TFT(203) - p -
 TFT(200) LDD . LDD TFT
 13 TFT가 (OFF n - TFT(203)
 (,)가 ,

14 (450) (460)
 (450) (511) (511)가 (512)
 , 가 . FPC(flexible p
 rinted circuit) (453) .

15 가 -
 (604) (601) (602), (603),
 TFT(605) n - TFT , (606) (607)
 (603) , (604)
 TFT(608)

TFT(608) (609) (609)
 (ground electric potential)((earth electric potential))가 . TFT(608)
 (610) (610) ()
 10 12 V) 가 .

/ FPC(611) / () (612,
 613) (609) / (614) , TFT

6

16a 16e , 1 2 가 . 16a 1
 6e (gettering) .

16a , (701) , , 1 50nm , CVD , SiH
 4, NH₃, N₂O 1 (701) 100nm CVD SiH₄ N₂O
 2 (703) 1 (702) 1
 , (704) CVD, CVD, 10 (704)
 (704) 5 x 10¹⁸ atoms/cm³ 가
 (mirror finish)() (trap) (oil - free)
 CVD

(Rh), 가 (704) 가 (Fe), (Ni), (Co), (Ru),
 (Pd), (Os), (Ir), (Pt), (Cu), (Au) . 1 100 ppm
 가 (spinner) 가 (705) 가
 (704) 가

- (705)
 - (705) (704) , 1

(704) - (705) 가
 (sodium) , (xenon arc) ,
) , RTA가 (RTA(rapid thermal ann
 ealing)

RTA가 , 가 1 60 , 30 60 , 1 10 ,
 2 6 600 1000 ,
 650 750 가 , 가
 가 (700) , 16b
 (706) .

500 가 1 , 4 550 6
 (704) 가 . , 16b
 00 , 580 (706)

()
 (706) YAG 2 3 가 400nm
 , 90 95% , 10 1000Hz
 100 400 mJ/cm² (706)

(706) () 가
 1 x 10¹⁹ atoms/cm³ 가
 TFT

16c (706) (707)
 가 , 200 350 UV
 . 1 5nm CVD, 가 (evap
 oration)

(708) 25 250nm (708)
 0.01 20 atomic %
 (708) (706) 가 가

(He), (Ne), (Ar), (Kr), (Xe)
 가 가 가 가 가
 2가 가 가 (dangling bond)
 (Ar), (Kr), (Xe) 가

RTA 가
 . RTA가 , 가 1 0.5 12 450 600
 2 6 , 30 60 , 1 10 ,
 700 750 가 , 600 1000 ,

() , 16e ,
 가 ,

1 x 10²⁰ atoms/cm³ (708) 가 가

가 (708)
 ClF₃ , (CH₃)₄NOH(tetraethyl ammonium hydroxide)
 (hydrazine) (707)
 (stopper) (707)

가 1 x 10¹⁷ atoms/cm³ (710) 16e
 (710) 1 2 가

7

17a 17c , 8 (706)
 . 150nm (706)
 (712)가 (711) , (706)
 (713)

17b , 0.5 12 450 600
 가 (706) (713)
 (711) (710) 1 2 가

8

6 (710) 1 1 10nm 1
 (720) 29 , 1 (720) 6
 (706), (707), (708), (709)
 (706) (708), 1
 (709)

9

가 , 가 , (aperture ratio) 가

가 , 가 .

가 VGA , 480 640 , XGA , 768 1024 , 18 460 mm , 13 가 340 mm .

TFT 1 1 2가 , Al Cu , Al Cu

Mo W 1 , Al Cu , 2 Al Cu , 3 Ti W Al Cu

18 , Ti , 3 W 1 , Al 2 (205) (206) 1

1 , ICP 가 , BCl₃, Cl₂, O₂가 , 65 : 10 : 5 , 1.2 Pa . , Al , CF₄, Cl₂, O₂ (25 : 25 : 10) W

2 BCl₃ Cl₂가 , 20 : 60 , 18 가 . , Al Ti , 18 (127e 132e), 2 (127 129) 2 (130 132) ((127f 132 f), 3 (127g 132g)).

18 , Al (131) , 4 () , Cu가 , Cu 5 Al

10

3 1 2 1 n- TFT 15 (,) 1 (enhancement type) TF T (,) , 2 T TFT (depression type) TFT가 , n- TFT TFT NMOS , EDMOS EEMOS , EDMOS

EEMOS 19a , EDMOS 19b . 19a , (31, 32)

n- TFT(E NTFT) , 19b , (33) E NTFT , (34)
n- TFT(D NTFT) , 19a 19b , VDH 가
() , VDL 가 () .

20a 20b 19a EEMOS , 19b EDMOS
. 20a 20b , (40, 41) - (flip - flop) . (42, 43)
E NTFT . E NTFT(42) (CL) , E NTFT(43)
(CL⁻) . (44) , 20b , 19a EEMOS
19b EDMOS . , TFT
n- TFT 가 .

11

가 10 E NTFT 21
23 n- TFT .

24 , (1001) . 25 , (1000) ()가
. (downstream) (upstream) .

, (1000)가 . (1000) () (1002)
. (1002) , A1, A⁻¹(A1⁻¹), A2, A⁻²(A2⁻²
), ..., An, A⁻ⁿ(An⁻ⁿ)) , 2n .

가 VGA 가 , 480 , 9 (n = 9)
, 18 (1002) 22
, An , A1 가 1 , A2 2⁻¹ , A3 2⁻²

(1003a) 1 NAND (, NAND) , (1003b) 2
NAND , (1003c) n NAND NAND
, n NAND 가 . , (1000)

NAND .

NAND (1003a 1003c) n- TFT(1004 1009) , NAND (1
003) 2n TFT가 . n- TFT(1004 1009) (1002)(A1, A⁻¹, A2, A⁻², ...,
An, A⁻ⁿ) .

NAND (1003a) , A1, A2, ..., An()
n- TFT(1004 1006) , (V_{DL})(1010)
(1011) . A⁻¹, A⁻², ..., A⁻ⁿ()
n- TFT(1007 1009) , n-
TFT(1009) (V_{DH})(1012) , n-
TFT(1007) (1011) . n-

NAND TFT (1011) NAND (1002) TFT (1003a 1003c) TF
 T (1011) NAND (1003a 1003c) (1013a 1013c)
 (1013a 1013c) NAND (1003a 1003c) (1013a 1013c)
 (1013a 1013c) n- TFT(1014 1016) (1011) n-
 TFT(1014)(1 n- TFT) . n- TFT(1014) (V_{DH})
 (1017) , (1018) . n- TFT(1015)(2 n
 - TFT) (V_{DH})(1017) , (V_{DL})(1019)
 , ON (1018)
 TFT (1013a 1013c) 1 n- TFT(n- TFT(1014)), 1 n-
 1015)) 1 n- TFT TFT(n- TFT(
 n- TFT(1016)(3 n- TFT) (Reset) , (V
 DL)(1019) , (1018) . (V_{DL})(1019) (V
 (GND)
 n- TFT(1015)(W1) n- TFT(1014)(W2) W1 < W2
 (1013a) (1011) 가 , n- TFT(1014) O
 FF () , n- TFT(1015) ON ()
 , (1019) (1018) 가 .
 (1011) 가 , n- TFT(1014) ON (1018)
 n- TFT(1014) n- TFT(1015) n- TFT(1014)
 (1018) , (1017) (1018) 가 ,
 (1011) 가 (n- TFT ON
) , (1011) 가 , (1018) ()
 n- TFT OFF) .
 n- TFT(1016) (1018) 가 (1018) 가 (1018)
 , n- TFT(1016) , n- TFT(1016)
 가 , n- TFT(1016)
 26 . 26 (1021), (1022), (1023) 가
 (1021) (1023)
 23 , (1022) 1 (1024) 2 (1025)
 . 1 (1024) 2 (1025) m n- TFT(1026a 1026c)
 (1027) . (1021) (1028) (1027) m
 n- TFT(1026a 1026c) . m

NAND 가 , VGA 가 , 640 , m = 1 ,
 NAND 80 , 14 (7) , m = 8 ,
 가 M M/m . NAND

n- TFT(1026a 1026c) (V1, V2, ..., Vk)(1029) ,
 (1028) 가 , n- TFT(1026a 1026c) ON , TFT
 가 . n- TFT(1026a 1026c)
 (1030a 1030c) .

2 (1025) (1027b) (1027b) m n- TFT(10
 31a 1031c) . n- TFT(1031a 1031c) (1032) ,
 n- TFT(1031a 1031c) (1032) 가 ON .

, (1030a 1030c) n- TFT(1031a 1031c)
 (1033a 1033c) , (1030a 1030c)
 (1023) . 21 (1034) .

n- TFT . 1 2 n- TFT

12

p- TFT 1 2 가 p- TFT가 . 24

24 , (1200) , (1201)
 ()가 ,

(1200)가 (1202) (1200) ()
) , A1, A⁻¹(A1), A2, A⁻²(A2
), ..., An, A⁻ⁿ(An) . 2n

(n = 9 , A1 가 1 , 480 , 9 , VGA
 , An , 2⁻⁽ⁿ⁻¹⁾ 가 , A2 , 2⁻¹ , A3 , 2⁻²
) . (1202) 25 , 18 , 25

(1203a) 1 NAND (NAND) , (1203b, 1203c) 2
 n NAND . NAND ,
 n NAND 가 , (1200) NAND

NAND (1203a, 1203c) p-TFT(1204, 1209)가 NAND (1203) 2n TFT가 p-TFT(1204, 1209) (1202)(A1, A⁻¹, A2, A⁻², ..., An, A⁻ⁿ)

210) NAND (1203a) A1, A2, ..., An(V_{DH})(1206)가 p-TFT(1204, 1206) (1200) A⁻¹, A⁻², ..., A⁻ⁿ(p-TFT(1207, 1209) (V_{DL})(1212) p-TFT(1209) 가 (1211) p-TFT(1207) (1211))

03c) NAND (1203a, 1203c) p-TFT (1211) n TFT (1211) NAND (1203a, 1203c) (1211) (1202)

214) NAND (1203a, 1203c) (1213a, 1213c) TFT p-TFT(1214, 1216) (1211) p-TFT(1214)(1 TFT) p-TFT(1215)(V_{DH})(1219) (GND)(1217) (1218) (1217) ON (1218) (1213a, 1213c) 1 TFT(p-TFT(1214)) 2 TFT(p-TFT(1215)) 1 TFT

p-TFT(1216)(1219) 3 TFT (Reset) (1218) (1217) (p-TFT가 ON)

W1 < W2 p-TFT(1215) (W1) p-TFT(1214) (W2)

214) OFF (1211) 가 p-TFT(1215)가 ON (1218) 가 (1219) (1218) 가

FT(1214) (1211) 가 p-TFT(1214) ON (1218) p-TFT(1214) (1217) 가 (1218) 가

(1218) TFT가 ON (1211) 가 (1211) 가
 p- (TFT가 OFF).

p- TFT(1216) 가 (1218) 가 (1218) 가
 가 . p- TFT(1216) .

26 . 26 (1301), (1302), (1303)
 . (1301) (1303)가 가 ,

25 . (1302) 1 (1304) 2 (1305)
 . 1 (1304) 2 (1305) (1307)
 m p- TFT(1306a 1306c) . (1301) (1308)
 (1307) m p- TFT(1306a 1306c) . m

, VGA , 640 . m = 1 , NAND
 640 , 20 (10) , , m = 8 ,
 NAND 80 , 14(7) . , 가 M 가
 , NAND M/m .

p- TFT(1306a 1306c) (V1, V2, ..., Vk)(1309) . , 가
 (1308) 가 , p- TFT(1306a 1306c) ON , 가
 p- TFT(1306a 1306c) .
 (1310a 1310c) .

, 2 (1305) m p- TFT(1311a 1311c)
 (1307b) . p- TFT(1311a 1311c) (1312) ,
 (1312) 가 , p- TFT(1311a 1311c) ON .

, (1310a 1310c) p- TFT(1311a 1311c)
 (1313a 1313c) , (1303) . , 24 ,
 (1314) . ,

가 , p- TFT ,
 , TFT 가 p- TFT . ,
 1 2 가 .

가 ; ; (goggle type) (); (navigation)

; ; (, (compo)); (laptop)
 ; ; (, , ,);
 가 . 27 28 .

27a (desktop) , (3301), (3302),
 (3303) (3303) 9 8
 TFT

27b (3311), (3312), (3313), (3314), (3315),
 (3316) (3312) 9
 8
 TFT

27c (3321), (3322), (3323), (3324), (3325),
 (3326) - () (3326)
 9 8
 TFT

27d (DVD) (3332), (DVD) (3331),
 (DVD) (3332), (3333), (a) (3334), (b) (3335)
 (a) (3334) (3334, 3335) 9 (b) (3335)
 8 T
 FT

27e (3341), (3342), (arm) (3343) (-
) (3342) 9 8
 TFT

27f (3351), (3352), (3353), (3354)
 (3353) 9 8
 TFT

28a (panel)(2701), (2702), (2703)
 (2701) , EL
 (2704), (2705), (2709) (2702) (2706),
 (2702), (2708) (2704) 9
 8 T
 FT

28b (3412), (3413, 3414) (3412) 9 (3411), FT 8 T

28c (3501), (A)(3502), (view finder) (3503), (3504), (B)(3505), (3506) (3502, 3505) 9 8 TFT

1 12 LDD n- TFT p- TFT

n- (photo mask) TFT LDD (active matrix) 가

(57)

1.

:

1 1 , 2 , 3 ;
1 , 2 , 3 2 ;
1 3 1 1 , 2 1 2 , 3 1 3 ;
1 1 , 2 1 2 , 1 3 (mask) 1
1 , 2 2 , 2 3 ;
2 2 , 2 2 , 1
2 2 2 , 3 2 3 ;

3 , 3 4 , 4 5 ,
 , .

2.

1 1 , 2 , 3 ;

1, 2, 3 2 ;

2 1 ;

1 2 ;

3 1 1 1 1 , 2 1 1 2 ,
 2 1 3 1 1 ;

1 , 1 , 2 , 3 1 ;

2 1 1 , 2 2 , 2 3 2 ;

2 2 , 2 2 2 , 1 ;

3 , 3 4 , 5 , .

3.

:

1 1 , 2 , 3 ;

1 2 1 1 ;

1 1 1 1 ;

3 2 ; 3 2 1 2 1

2 2 2 3 1 2 1
 3 ;

2 , 2 , 1
2 2 , 3 2 3 ; 2

3 , 3 4 , 4 5 ,
4 5

4.

1 1 , 2 , 3 ;

1 , 2 , 3 2 ;

2 1 ;

1 2 ;

1 1 1 1 1 1
2 ;

1 , 1 1 1 1 1

2 2 3 1 2 1 3
2 1 2 ;

2 2 2 3 3 1 2
1 3 ;

2 , 2 2 , 1
2 3 ;

3 , 3 4 , 4 5 ,
4 5

5.

2 , 1 Ta, W, Ti, Mo

2 Ta, W, Ti, Mo

6.

3 , 1 Ta, W, Ti, Mo

2 Ta, W, Ti, Mo
,

7.

4 , 1 Ta, W, Ti, Mo
,

2 Ta, W, Ti, Mo
,

8.

2 , 2 , .

9.

3 , 2 , .

10.

4 , 2 , .

11.

2 , 2 , .

12.

3 , 2 , .

13.

4 , 2 , .

14.

1 , (navigation) , (laptop) , (goggle type) , , .

15.

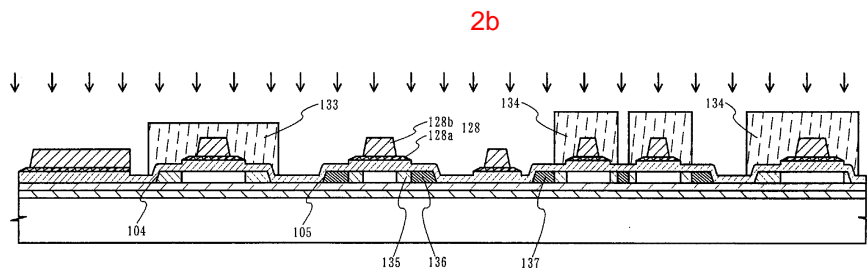
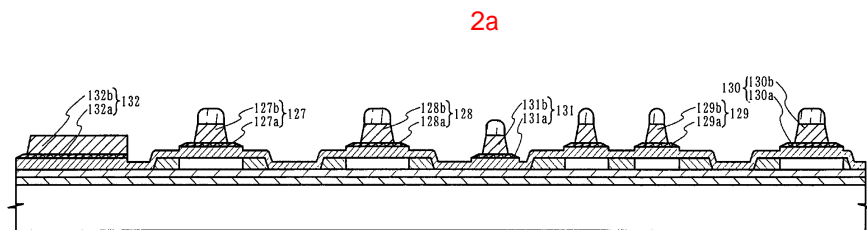
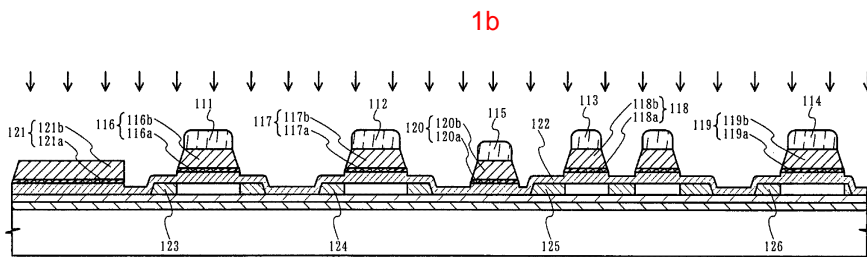
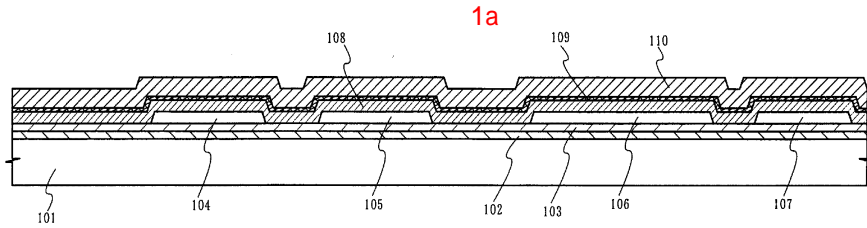
2 , (navigation) , (laptop) , (goggle type) , , .

16.

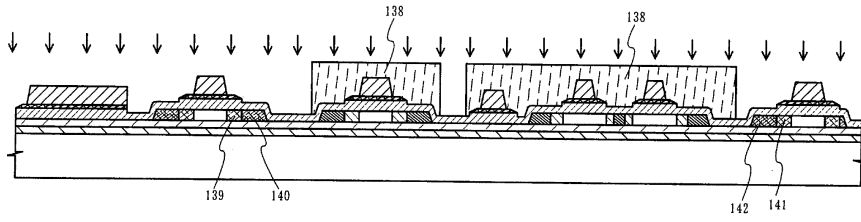
3 (navigation) (laptop) (goggle type)

17.

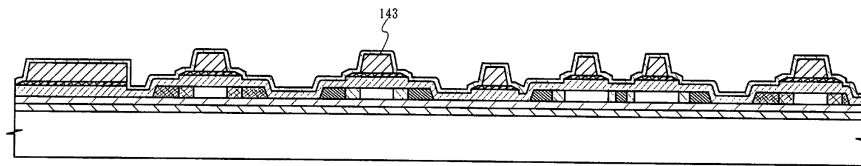
4 (navigation) (laptop) (goggle type)



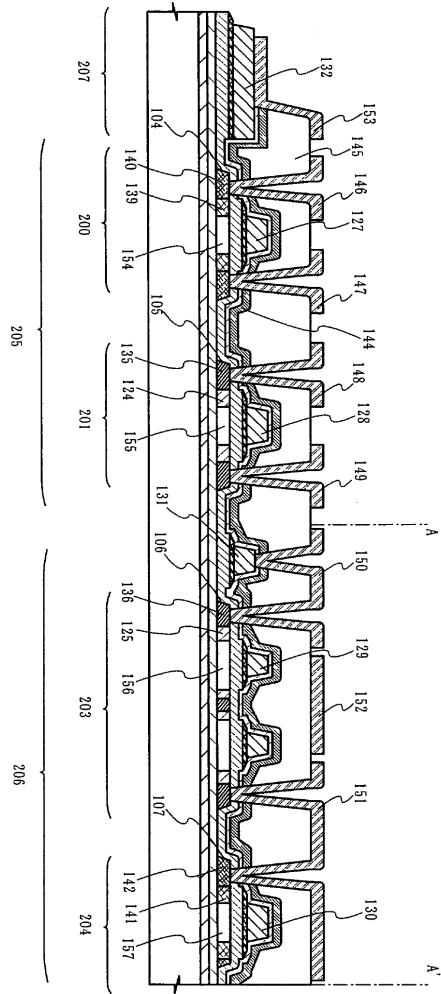
3a



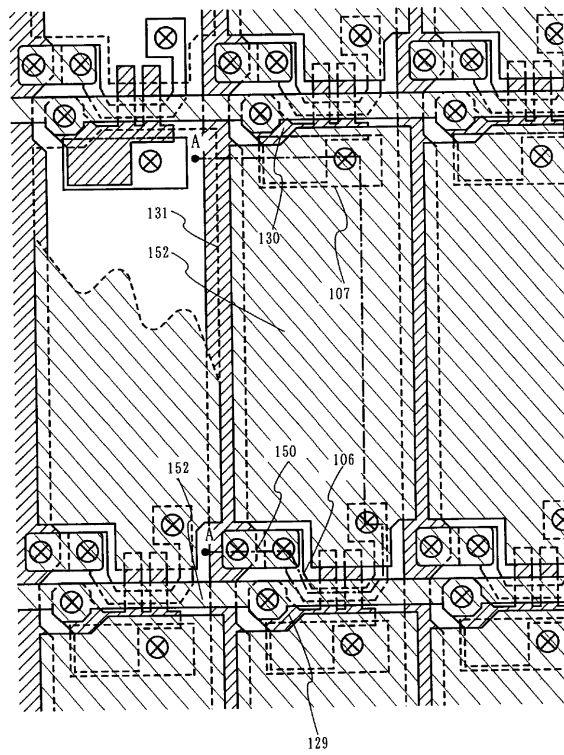
3b



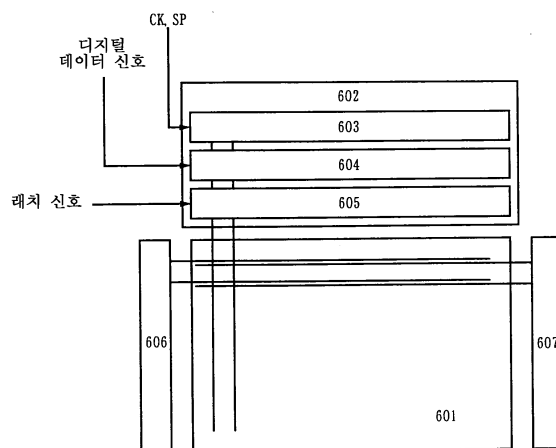
4



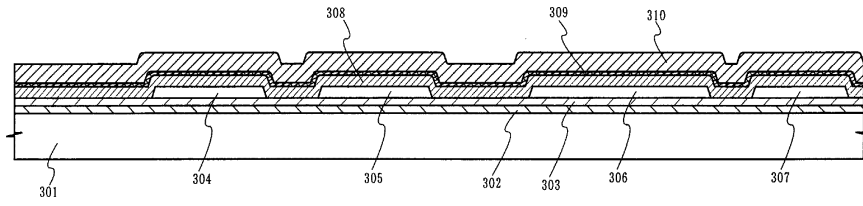
5



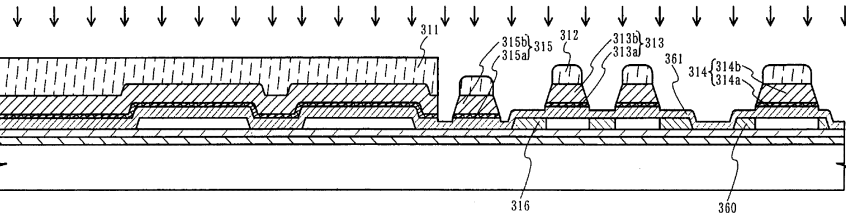
6



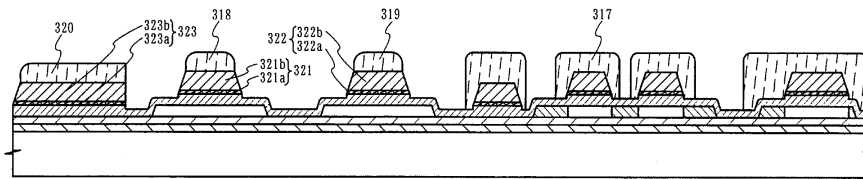
7a



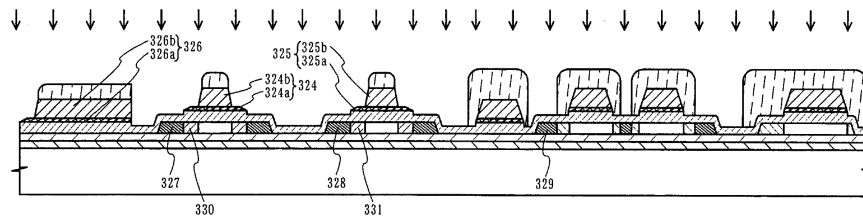
7b



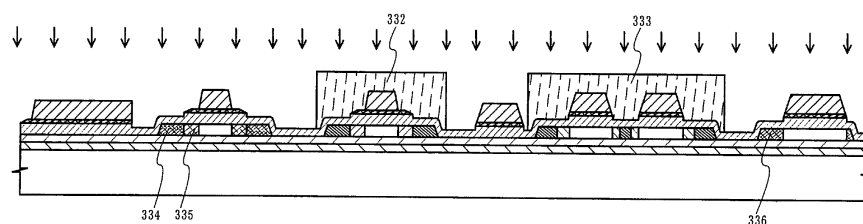
8a



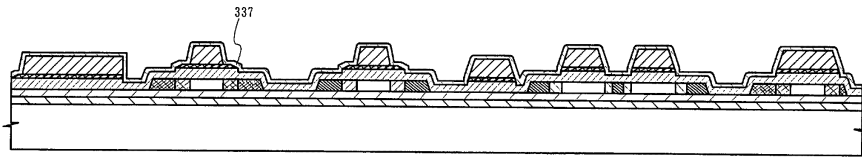
8b



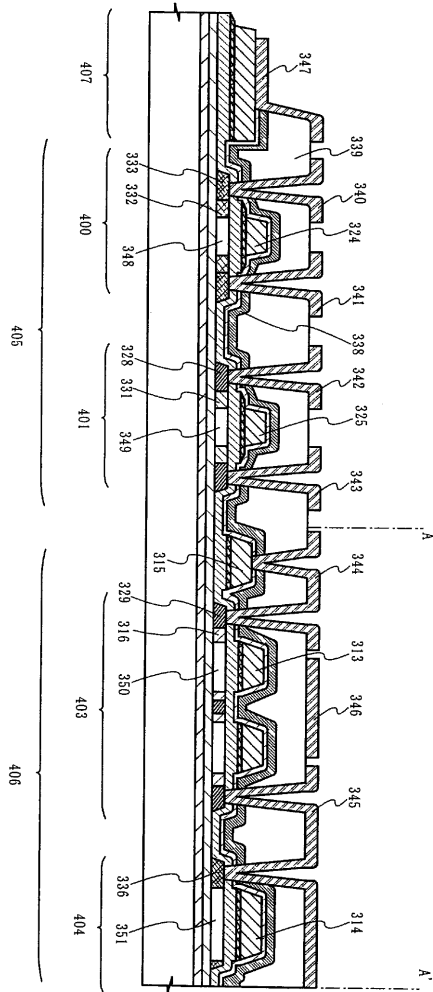
9a



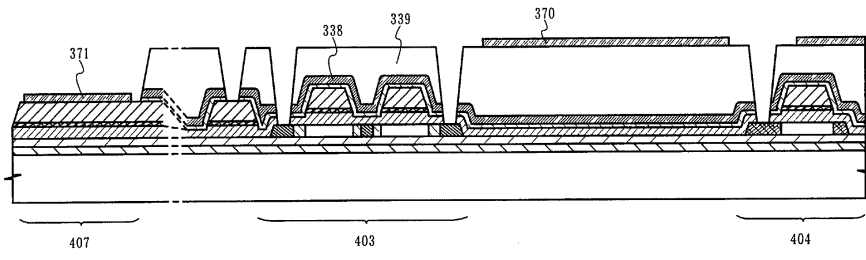
9b



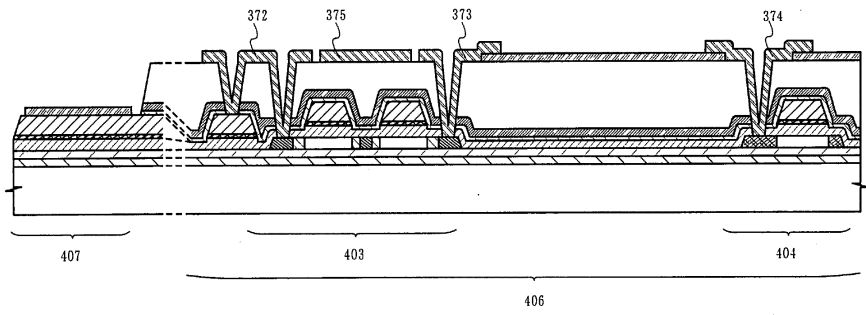
10



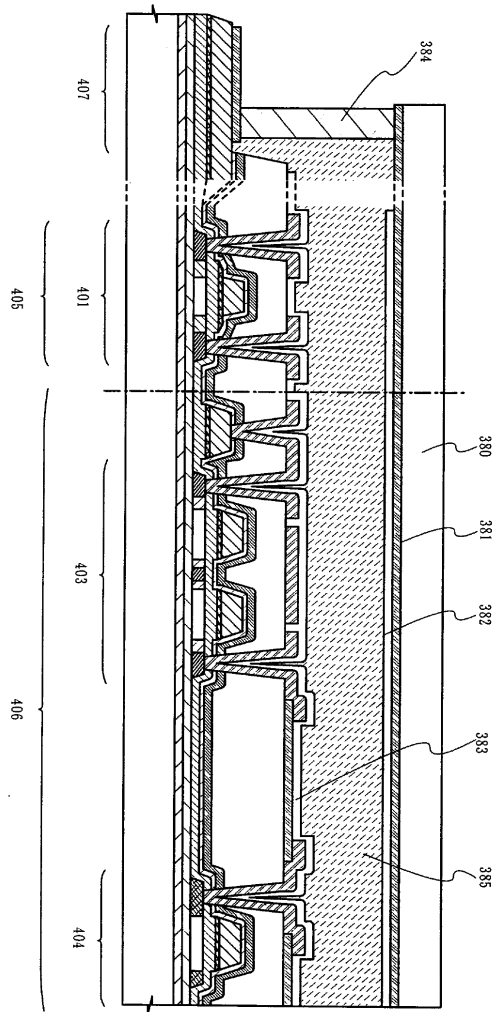
11a



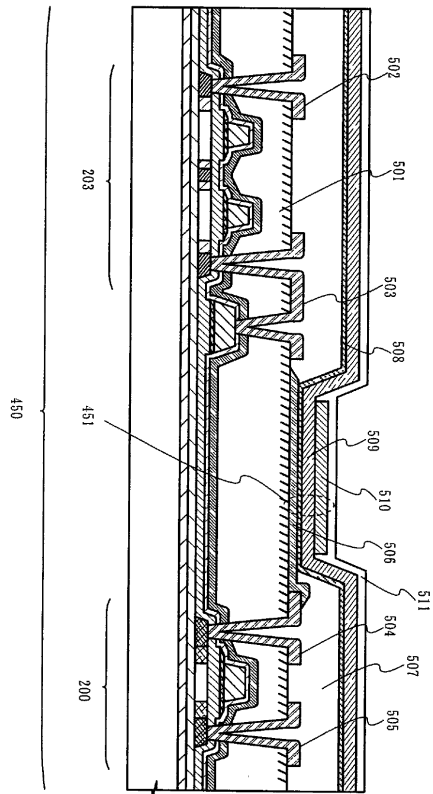
11b



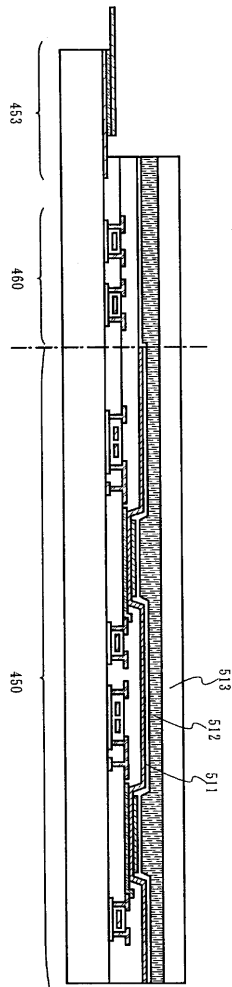
12



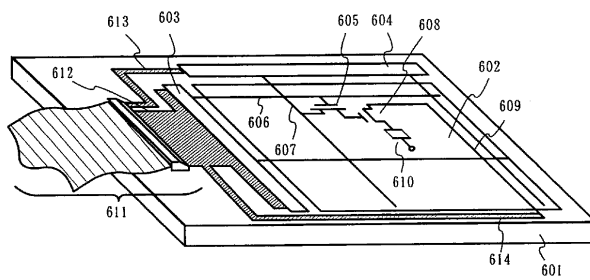
13



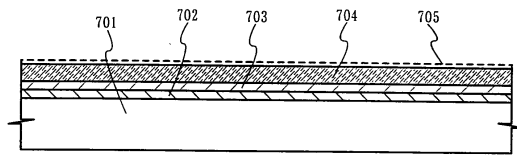
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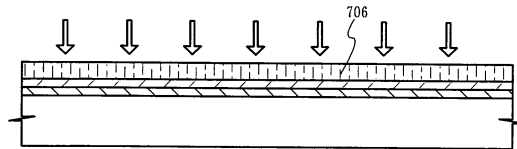
15



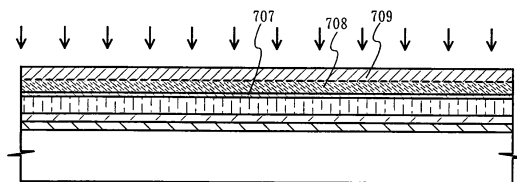
16a



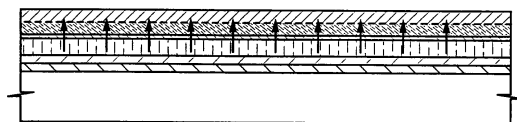
16b



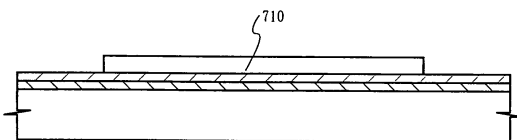
16c



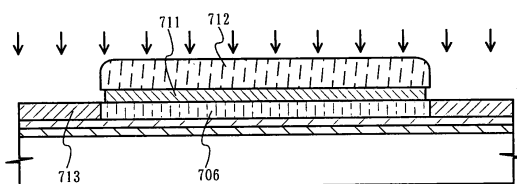
16d



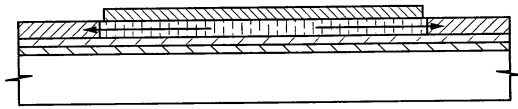
16e



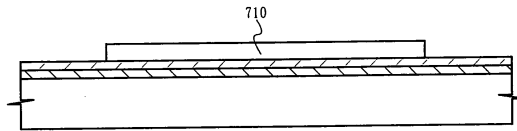
17a



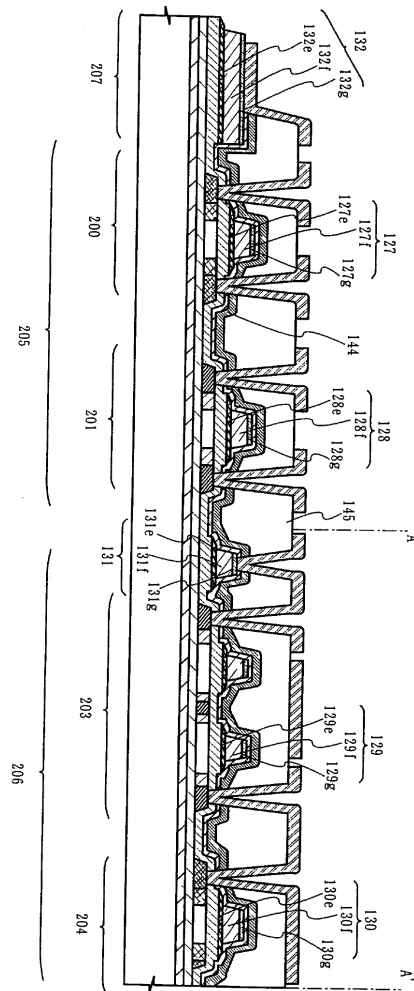
17b



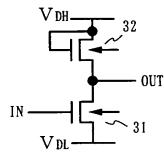
17c



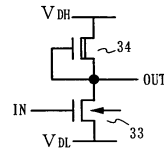
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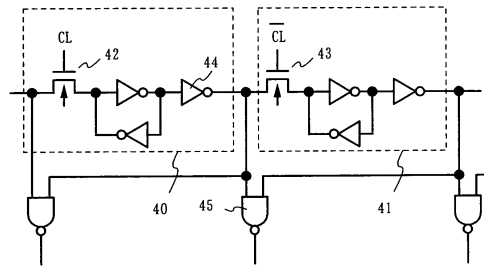
19a



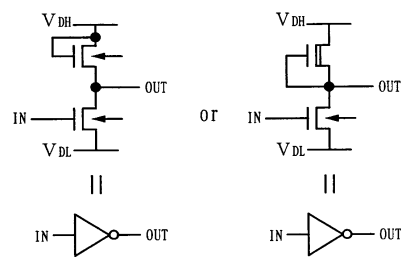
19b



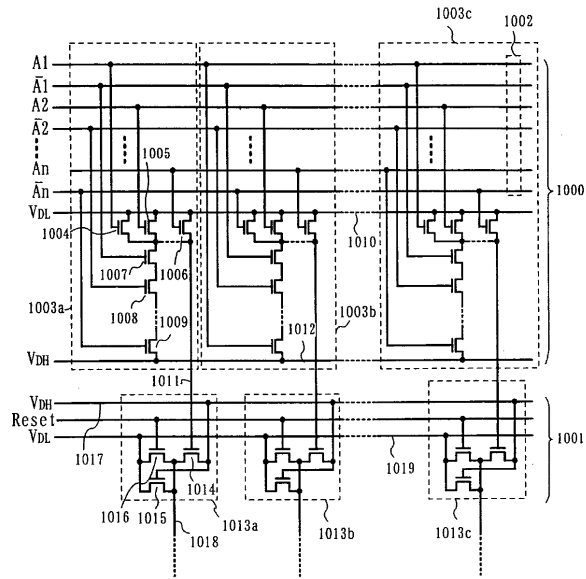
20a



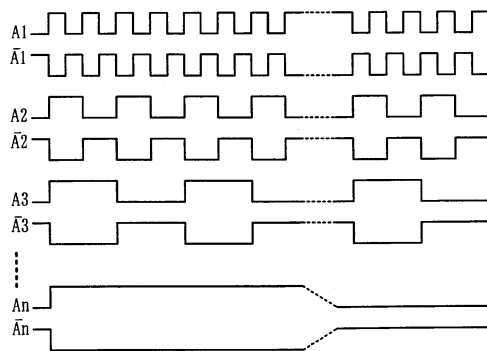
20b



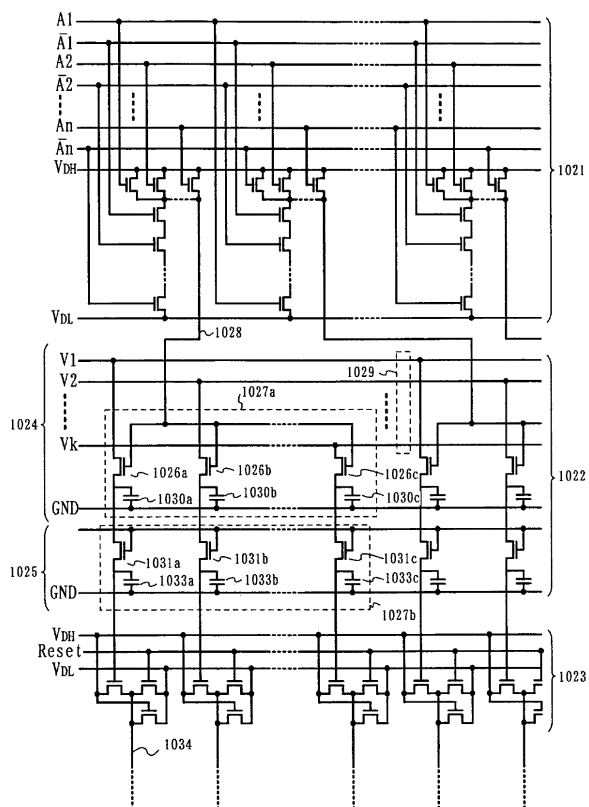
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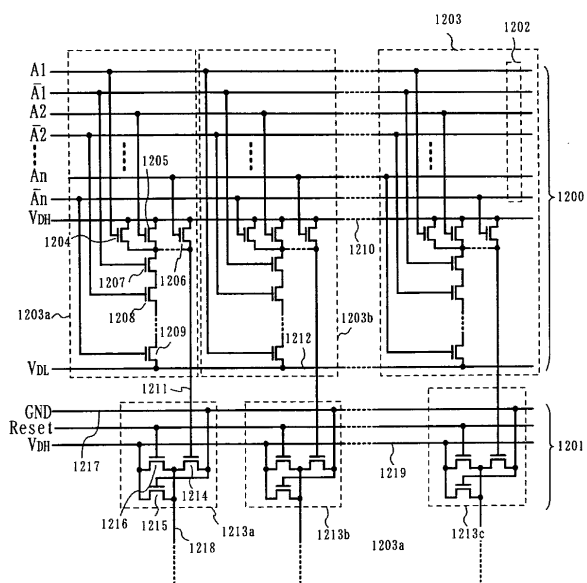
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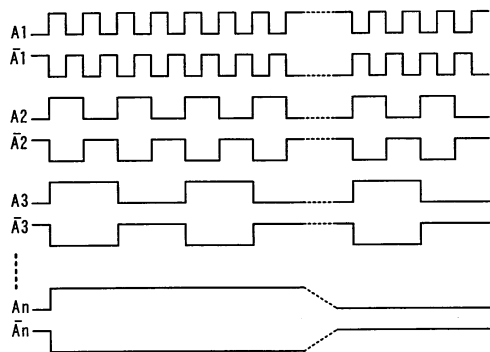
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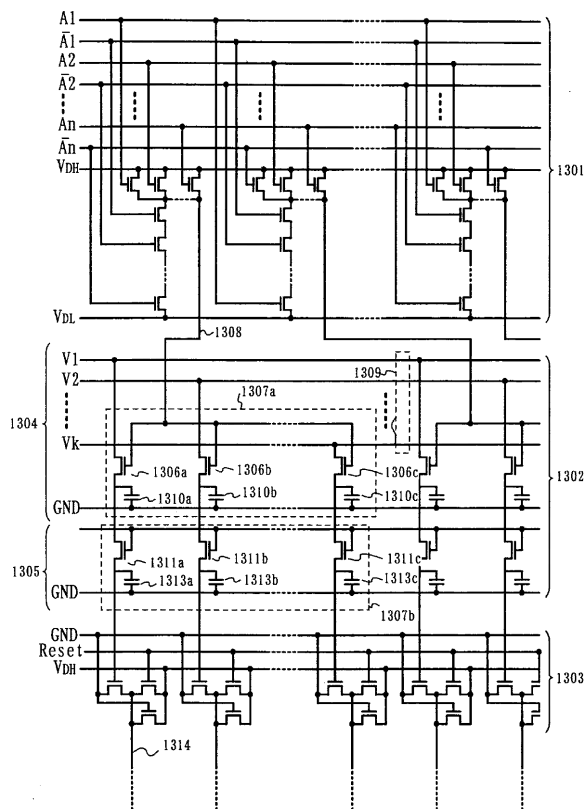
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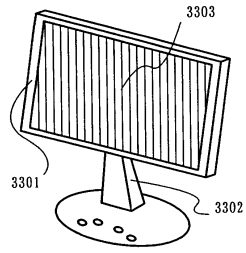
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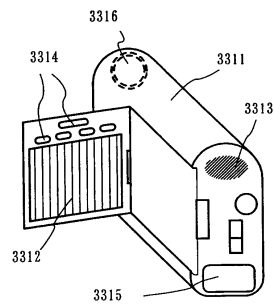
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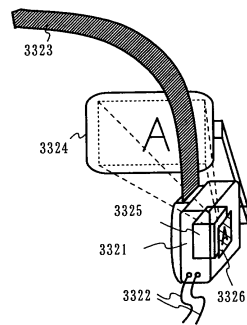
27a



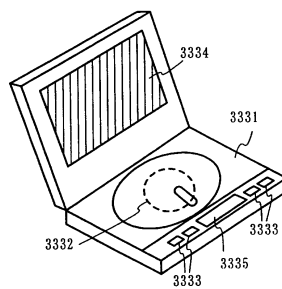
27b



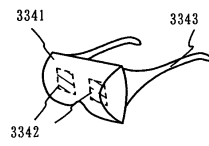
27c



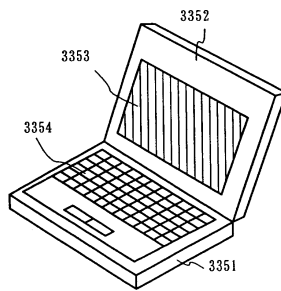
27d



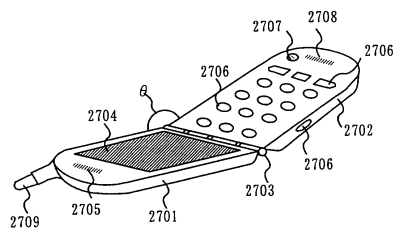
27e



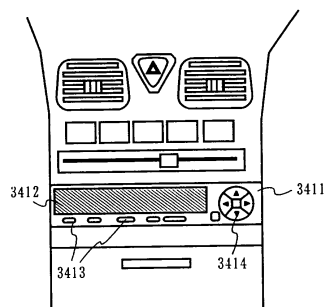
27f



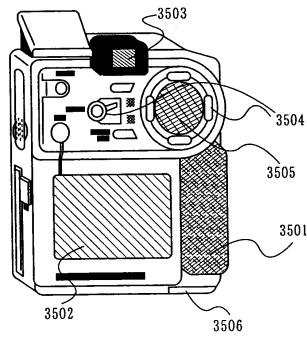
28a



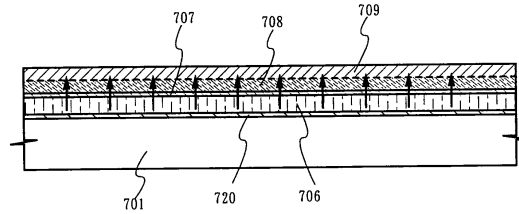
28b



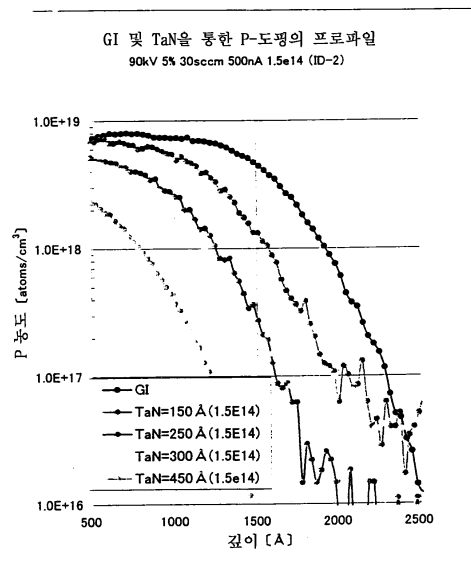
28c



29



30



TaN 두께를 GI 두께로 변환하는 것을 통한
피팅에 의해 구해진 프로파일
90kV 5% 30scm 500nA 1.5e14 (ID-2)

