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2002 - 0018640
2002 03 08

(21) 10 - 2001 - 0085730
(22) 2001 12 27
(62) 2000 - 0000832
: 2000 01 10

2000 01 10

(30) JP - P - 1999 - 00003812 1999 01 11 (JP)

(71) 가 가
가

가 4 6

(72) 가 3713 - 3

2660 - 13

24 - 8

3550

1 - 45

5 - 7 - 1 - 11

(74)

:

(54)

가 .

가

가

가

4

1A p - SiTFT

1B 1A p - SiTFT

2 1A p - SiTFT

3A - 1 3A - 3 3B - 1 3B - 3 a - Si p - Si

4A 4D MIC MILC p - Si

5A 5C p - SiTFT 5A
p - Si 5B 5C

6A 6B
6A 6B

7A 7D MIC MILC p - Si

8A 8F p - SiTFT

9A 9F p - SiTFT

10A 10C p - SiTFT

11

12A 12B 11 12A
12B

13

14 13 -

15

16 15

< >

1 : p - Si () 1a, 1b, 16 : p - Si

2 : 3 :

4 : 5 :

6 : 7 :

8 : 9, 10 :

11, 18 : a - Si 12a, 12b :

13 : 14 :

15 : 17 :

19 : 20 :

71 : 72 :

73 : 74 :

75 : 76 :

77 : 100 : p - SiTFT

101 : AOF :

AS : ASB :

BL : BM :

Cadd : DL :

FIL : FPC1, FPC2 :

GBL : GBS :

GC1, GC2 : GI :

GL : GT :
 ITO1 : ITO2 :
 LC : LCT :
 LP : LPC1, LPC2 :
 LS : MCA :
 ORI1 : ORI2 :
 PCB : POL1, POL2 :
 PRS : PSV1, PSV2 :
 RFS : SD1 :
 SD2 : SHD :
 SIO : SPC1 4 :
 SPS : SUB1 :
 SUB2 : TFT1, TFT2 :
 WD :

(, TFT)

(, LCD) 가

(, p-SiTFT)

(, a-Si) , a-Si , CVD

a-Si , 20ns a-Si
 가

가

가 -

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가 .

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가 ,

가 ,

가

가

p - SiTFT

p - SiTFT(100)

1A

1A

p - Si (1)

3

, 1

, 4

(, p - Si)

, 8

(3)

가 가

, 6, 7

(SiO₂)

(, p - Si) , 2

, 5 SiO₂

, 9, 10

1B

(4)

1A

p - SiTFT(100)

(101)

(5)

(6)

(4)

(7)

SiTFT p-SiTFT (W) 3 20 μ m, (L) 1 5 μ m , p-
(W) 4 10 μ m, (L) 3 5 μ m .

2 1A p-SiTFT(100) .

2 , 1 p-Si , 2 p-Si (1) ,
가가 , 4 .

1A , p-SiTFT(100) (3) (8) p-Si
(1), p-Si (1) , 가가
(2) , p-Si (1) (5) , p-Si (1) (5)
(4) , (4) p-Si (1) , (6, 7) 가
. 2 , (2) p-SiTFT(100) p-Si (1)

, 1B , TFT 가 3 μ m
, (L) , 가
(1B 3) . (4) 0.5 μ m

, TFT , TFT
, 가 , 0.05 μ m 0.3 μ m
, (6, 7) p-Si (1) (8)
, n p LDD
(6, 7) ,

3A - 1 3A - 3 3B - 1 3B - 3 a-Si p-Si , 3A - 1 3B - 1
, 3A - 2 3B - 2 ,
3A - 1 3A - 3 가 , 3A - 3 3B - 3 ,
3B - 1 3B - 3 가 .

3A - 1 3A - 3 3B - 1 3B - 3 , 3 , 11 (3) a-Si , 13
, 12a, 12b , 1a, 1b p-Si .

p-Si , a-Si ,
(13) a-Si (11) 가 3A - 1 3B - 1 ,
(3) (3)

, 3A - 2 3B - 2 (3) a-Si (11)
(12a, 12b) , p-Si (1a, 1b) . 가 3A
- 2 (12a) , , 3
A - 3 p-Si (1a) .

, 가 , 3B - 2 (12b) ,
가 3B - 3 p-Si (1b) .

, p - Si TFT

가 , 가

Sequential lateral solidification of thin films on SiO₂ ", Appl.Phys.Lett.69(19), 4 Nov. 1996, pp.2864 - 2866) , (移相) (phase - shift mask) (C.H.Oh and M.Matsumura:" Preparation of Position - Controlled Crystal - Silicon Island Arrays" , Jpn.J.Appl.Phys.Vol.37(1998)pp.5474 - 5479)

, 가 , 가 , 가

, MIC(Metal Induced Crystallization), MILC(Metal Induced Lateral Crystallization) , 가

MIC , Au, Al, Sb, In, Pd, Ti, Ni a - Si , 가 , 가 600 가 가 600

, Au, Al, Sb, In 4 a - Si c - Si (Si) c - Si a - Si c - Si Si Si c - Si a - Si (E.Ny gren, et. al,Appl.Phys.Lett.52(6)pp.439 - 441(1998)).

, Pd, Ti, Ni a - Si c - Si (C.Hayzelden and J.L.Batstone, J.Appl.Phys.73(12)pp.8279 - 8289(1993)).

MIC 가 , MILC , p - Si , 1 μm , (固相) 가 (Seok - Woon Lee, et.al, Appl. Phys.Lett.66(13)pp.1671 - 1673(1995)).

4A 4D MIC MILC p - Si , 4A , (3) 1 a - Si (11) , (14) p - Si (15) (14)

, MIC MILC a - Si p - Si 가 (< 600) p - Si (11) p - Si (16) ((14) p - Si (16)) , (14) 가 , MILC가 . 17(4B)

MILC

(14) 가 0.5 μ m a-Si (14)
 (14) 4B (15) a-Si a-Si (14)
 가 (17)가

4C 2 a-Si (18) a-Si (18)
 (), 4D p-Si (16) a-Si (18)
 가 (17)) 가

가 가 가

p-Si (21) 4A 4B
 p-Si (1) (1A). Si
 가 가

10 μ m 가 5A 5C

5A 5C , p-Si TFT(100) 5A (3)(
) p-Si (1) p-Si (1) (2)
 (4) 5B , 5C

5B 가 (5A p-Si)

5B 가 5C

6A 6B 가 6A
 , 6B

6A , 20 , 19

p-Si TFT , SOI
 Si-LSI (正孔)
 가 , SOI

가 , , 가 .
 가 - , p - Si (1) , 가가 (2)
 SOI
 (Proc.of 5th Int'l Symp.on SOI Tech.and Devices,Vol.92 - 13,p64(1992), , M
 IC MILC
 가 .
 , 4A (14) a - Si (11) , 7A a - Si (11)
 7A 7B 7D a - Si (11) (14)
 , , ,
 , 8A 8F .
 , 8A 가 20nm a - Si (11) CVD (3) SiO₂ , 450 (8) 가 ,
 a - Si 1atomic% .
 , 8B , W, Au, Al, Sb, In, Pd, Ti, Ni TFT (15)
 1 () (14) ,
 , 8C , 600 , a - Si (11) (固相)
 p - Si (14) a - Si (11) p - Si (16) (14)
 p - Si (16)) , (14) 가 ,
 MILC가 17 MILC .
 VD , 8D , 8C 가 20nm a - Si (18) C
 , 450 , 30 가 a - Si 1atomic% .
 , 8E , 308nm XeCl 248nm KrF a - Si (18)
 , p - Si (1) , p - Si (1) p - Si (21)
 , 8F .
 p - Si (1) 1A p - SiTFT(100)
 , 8F p - Si (16) 1A (2) . 8F p - S
 i (16) 8B a - Si (11) . p - Si (16) 1A .
 14 , p - Si (16) .
 , 8C 8D (17) 8D a - Si (18) , a - Si (1
 8) p - Si (1) (p - Si (16)) 8E, 8F (17)
 p - Si . p - Si
 , 1A (17) p - Si p - Si(1) (2)
 , p - Si .

a - Si (8A 11) (8B 14) .

a - Si , a - Si p - Si
 p - Si(8C 17) (8B 14)가 p - Si (8D 16)
 Si(8B 17) 가 a - Si(8D 11) a - Si (8D 17) a - Si (8D 18) , p - Si (8E 1 1A 1) 가 . a - Si (8D 18) , p - Si (8E 1 1A 1) 가 .

ity)가 TFT p - Si 가 (mobil
 , a - Si 가 , 가
 a - Si . , 가
 , 9A (3) SiO₂ (8)
 W, Au, Al, Sb, In, Pd, Ti, Ni 1
 (14) , TFT (15) ()

i (11) 9B (15) 가 (14) (3) 가 20nm a - S
 tomic% CVD , 450 30 가 a - Si 1a

- Si 9C , 600 a - Si (11) p - Si (16) a - Si (11) p (14) p - Si (16)
 16)) , (14) 가 , MILC

가 9D , 9C 20nm a - Si (18) CVD
 , 450 30 가 a - Si 1atomic%

, 9E , 308nm XeCl 248nm KrF a - Si (18)
 , p - Si (1) , p - Si (1) p - Si (21)
 8F .

p - Si (1) 1A p - SiTFT(100)
 , 9F p - Si (16) 1A (2) .

, (15) 가 a - Si .

, 10A (3) SiO₂ (8)
 (14A) , (A) W W Au, Al, Sb, Pd, Ni
 TFT (15A)

, 10B (A) (B) CVD
 가 20nm a - Si (11) , 450 30 가 a - Si (11)
 1atomic% .

10C (114) (A) (B) 600 (A) (15A) TFT a-Si (11) (B) Au, Al, Sb, Pd, Ni (115A) (115B) p-Si

13 SXGA (1024 x 1280) 50nm (W) 5mm 10 2
 Pd p-Si 가 가

LP() CVD 20nm 1 a-Si , 550 3
 1 a-Si

CVD 2 a-Si 50nm 450 1 가

2 a-Si 308nm XeCl

100μm 100μm, 250mm
 300mJ/cm², 1 10 -

mJ/cm², 1 5 18mm 5mm x 18mm, 300
 p-Si CVD , p-Si TFT

11 , 71 , 72 , 73 , 74 , 75
 , 76 , 77

12A 12B 11 1 , 12A , 12B

13 가
 , 14 13 -

13 2 () (GL) ,

2 () (DL) (4)
 (TFT1, TFT2), (ITO1) (Cadd)
 (GL) (DL)
 SD1, SD2
 GT , FIL , BM

14 (LC) (SUB1) (TFT)
 (ITO1) (SUB2) (FIL), (BM)
 (SUB1, SUB2) (dipping) (SIO)

(SUB2) (LC) (BM), (FIL), (PSV2),
 (ITO2)(COM) (OR12) POL1, POL2 , PSV1
 , OR11 , GI , AOF , AS

15 가 () (MDL)

SHD (), WD , SPC1 4 , FPC1, F
 PC2 (FPC1 , FPC2), PCB
 , ASB , PNL 2
 IC (), GC1 GC2 , PRS (2), SPS
 , GLB , RFS , MCA (), LP ,
 LPC1, LPC2 , LCT , GBS (LP)
 가 (MDL)

LS, BL

16 15 PC,

, SOI TFT 가

, COG()

가 가

가

가

TFT , SOI 가 , ,

(精細)

(57)

1.

1 (grains)

2

1

3 μm

2

0.05 μm

2.

1

2

0.05 μm

0.3 μm

3.

1

4.

1

1

5.

4

600

6.

4

2

2 1 .

7.

5 ,

8.

1 가 ,

2 가 ,

2 1 .

9.

8 ,

1

10.

8 ,

1 3 μm , 2 0.3 μm

11.

8 ,

1 3 μm , 2 0.05 μm

12.

8 ,

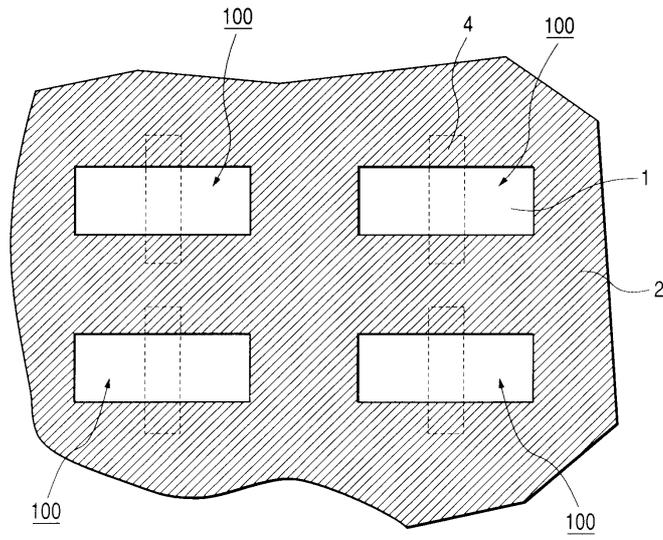
2 0.05 μm 0.3 μm .

13.

,

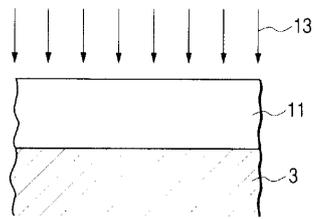
1 ,

2

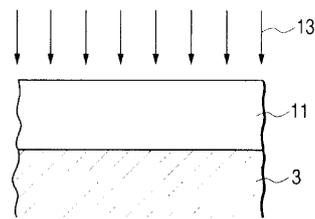


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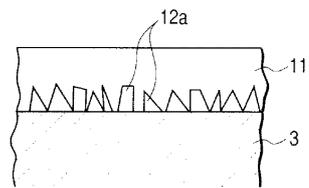
A-1



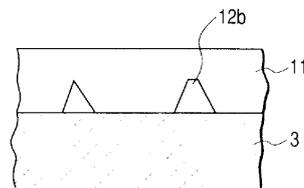
B-1



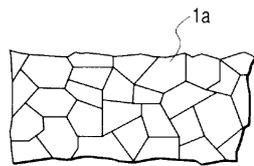
A-2



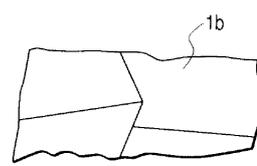
B-2



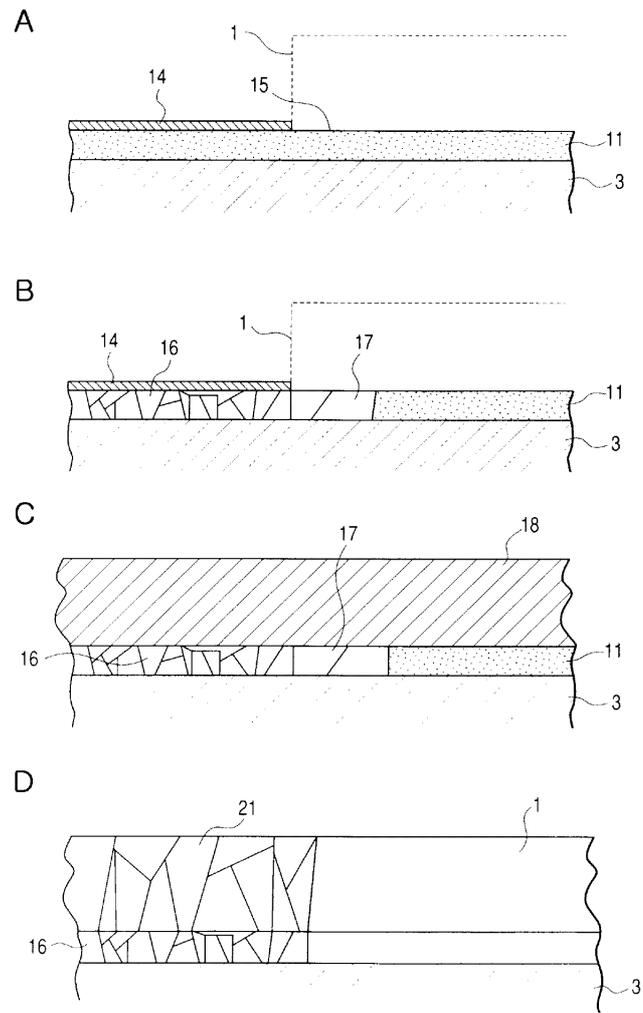
A-3



B-3

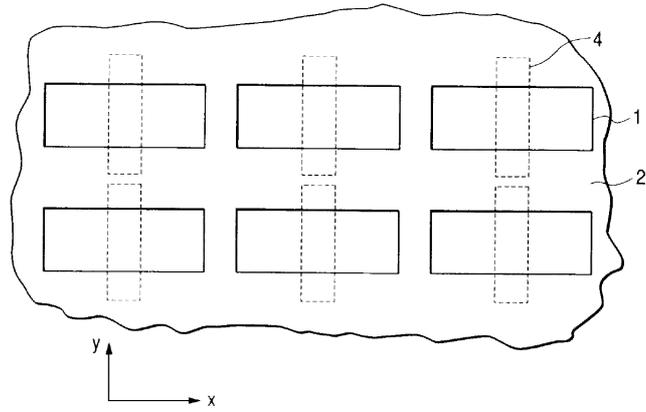


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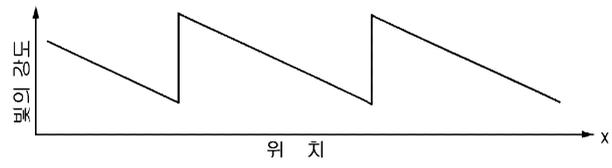


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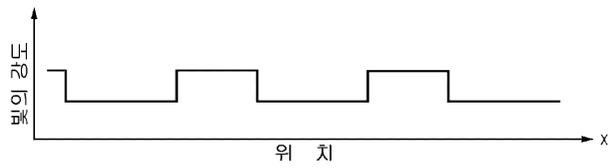
A



B

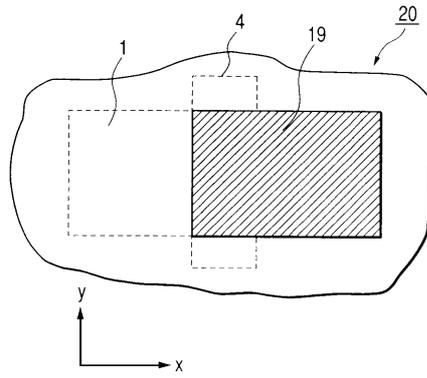


C

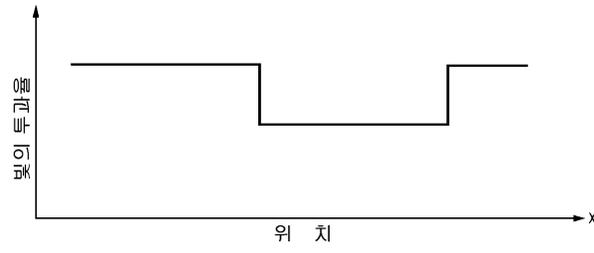


6

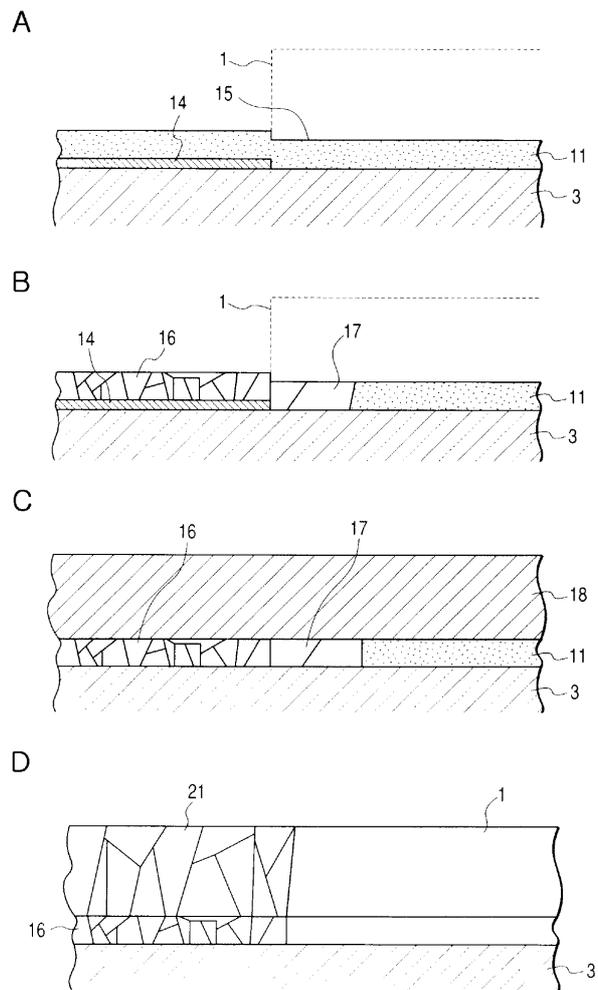
A



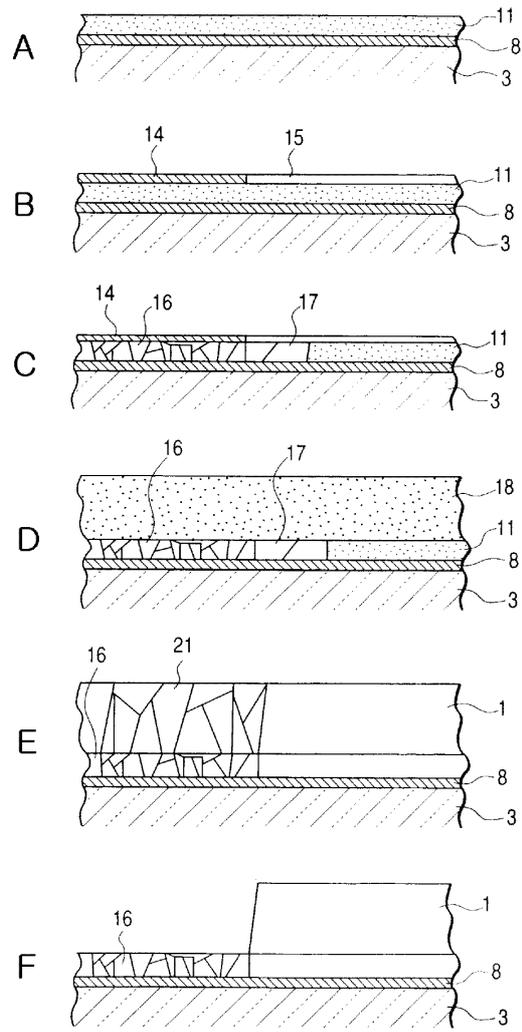
B



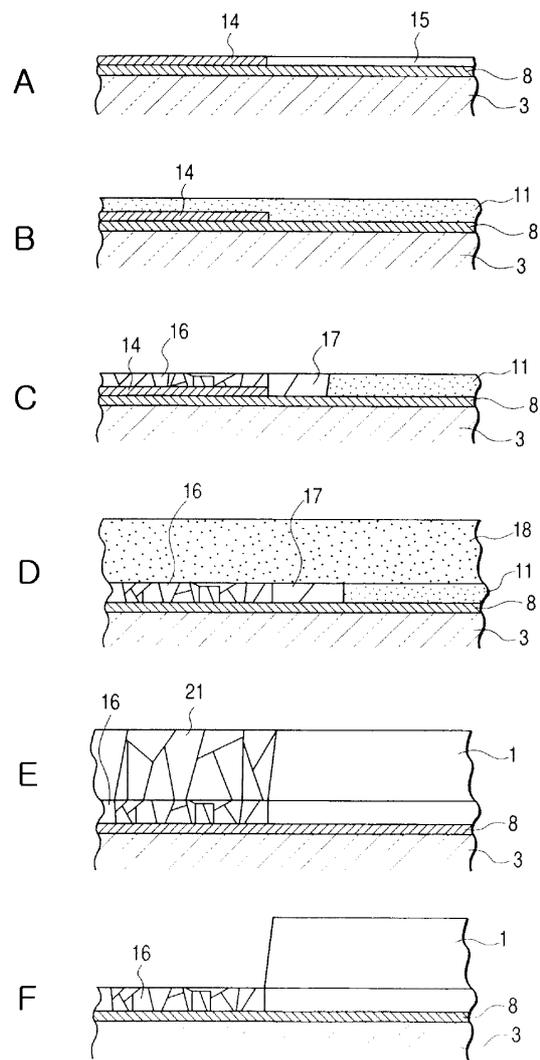
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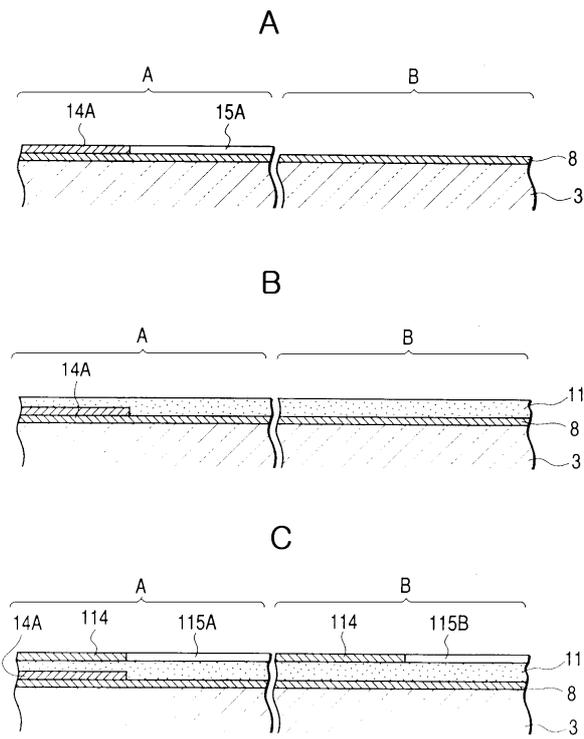
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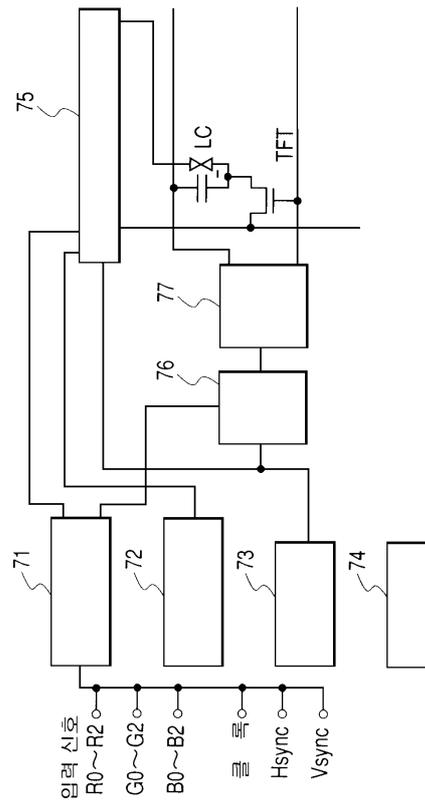


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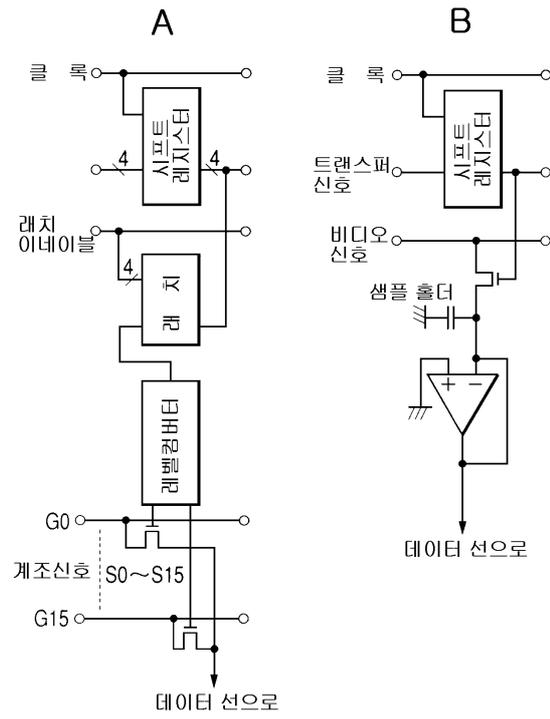


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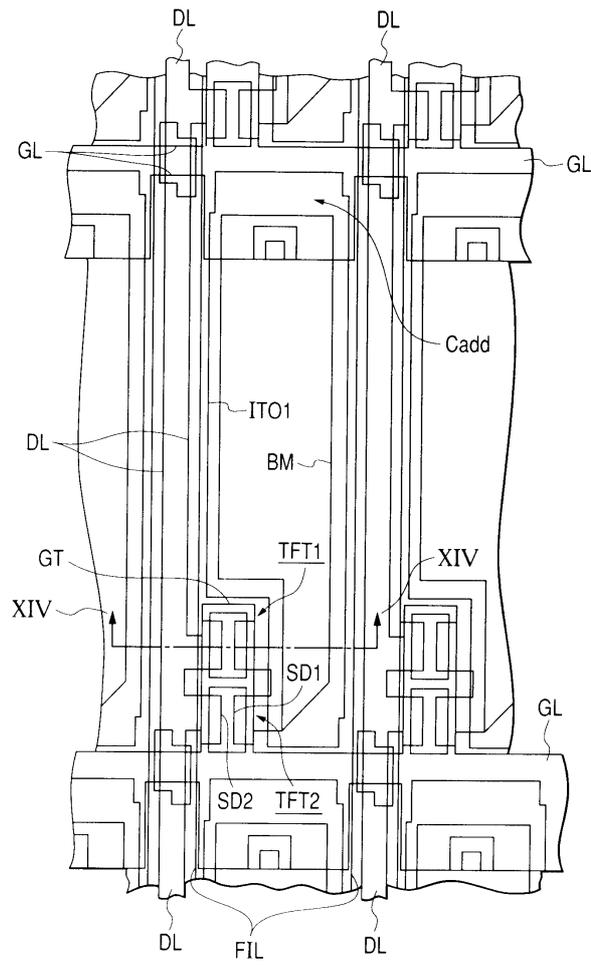


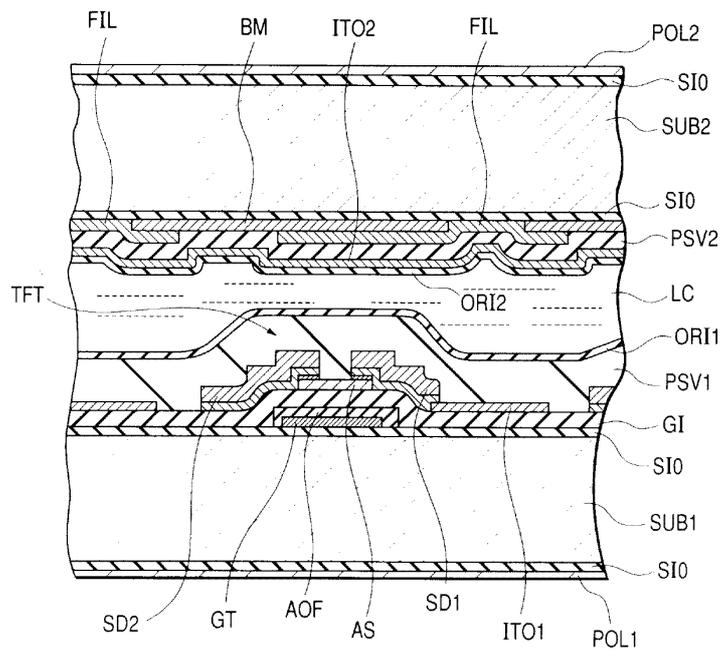


12

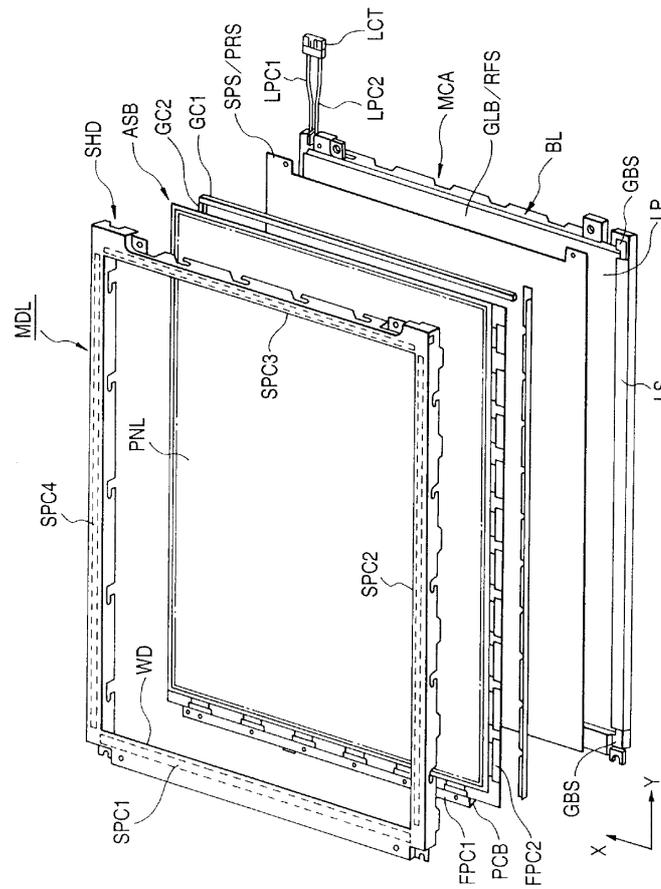


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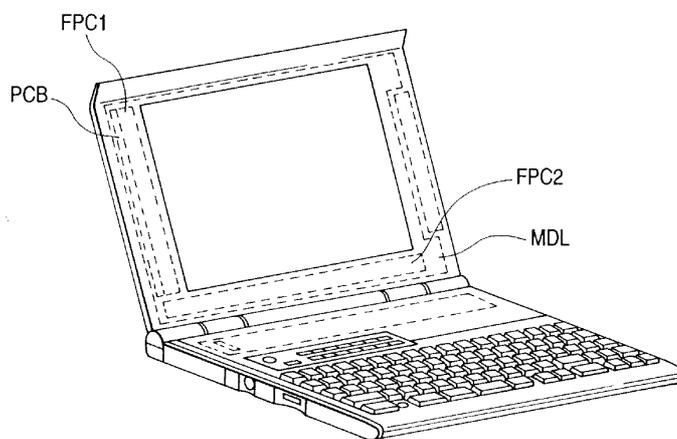




15



16



专利名称(译)	显示设备		
公开(公告)号	KR1020020018640A	公开(公告)日	2002-03-08
申请号	KR1020010085730	申请日	2001-12-27
[标]申请(专利权)人(译)	日立HITACHI SEISAKUSHODBA		
申请(专利权)人(译)	株式会社日立制作所		
当前申请(专利权)人(译)	株式会社日立制作所		
[标]发明人	SUZUKI KENKICHI 스투키켄키치 NAGATA TETSUYA 나가타테쯔야 OGINO TOSHIO 오기노토시오 SAITOU MASAKAZU 사이토우마사카즈 TAKAHASHI MITSUKO 타카하시미쯔코 MIYAO MASANOBU 미야오마사노부		
发明人	스투키켄키치 나가타테쯔야 오기노토시오 사이토우마사카즈 타카하시미쯔코 미야오마사노부		
IPC分类号	G02F1/1368 G02F1/1362 H01L21/84 H01L29/786 H01L21/77 H01L21/336 H01L29/04 G02F1/136 H01L21/20		
CPC分类号	H01L29/78675 H01L27/1285 H01L27/1277 H01L29/04 H01L21/2022 G02F1/13454 H01L29/66757 H01L27/1296 H01L21/2026 H01L21/02672 H01L21/02675 H01L21/02691		
代理人(译)	李钟IL		
优先权	1999003812 1999-01-11 JP		
其他公开文献	KR100386181B1		
外部链接	Espacenet		

摘要(译)

目的：提供一种高性能TFT，包括单晶晶粒取向的多晶薄膜，晶界杂质少，多晶薄膜的粒径大于晶体管的沟道长度，而尺寸为单晶渠道部分。组成：在基板3上形成第一a-Si膜11，在基板3上形成金属膜14作为基材膜，在金属膜14上形成对应于待形成的TFT区域的开口15，然后使用MIC和MILC在600°C或更低温度下进行热退火，使得金属膜14下面的a-Si膜11变成p-Si膜16，同时金属膜14被吸收到p-Si中。在薄膜16中，允许晶粒横向生长以形成大粒径的晶粒17，并且用准分子激光照射a-Si膜18以使其成为多晶。

