

(19)
(12)

(KR)
(B1)

(51) 。 Int. Cl.7
G02F 1/1335

(45)
(11)
(24)

2004 04 13
10-0426750
2004 03 30

(21) 10-2001-0052333
(22) 2001 08 29

(65)
(43)

10-2002-0060556
2002 07 18

(30) JP-P-2001-00003186 2001 01 11 (JP)

(73) 가 가 가 4 6

(72) 1 5 1 가 가

가 1 5 1 가 가

1 5 1 가 가

1 5 1 가 가

(74)

:

(54)

가 .

() 0 4 1 , .

1

1 .
 2 .
 3 .
 4a 4b ,
 5a 5b , 50 .
 6a 6b , 50 .
 7a 7b , 60 .
 8a 8b , 60 .
 9a 9b , 70 .
 10a 10b , 70 .
 11a 11b , 80 .
 12a 12b , 80 .
 13a 13b , 90 .
 14a 14b , 90 .
 15 .
 16a 16b ,
 17 t
 18a 18b - .
 19a 19b .
 20a 20b .
 21 .

- 101 :
- 102 :
- 103 :
- 104 :
- 109 :
- 130 :
- 131 :
- 135 :
- 137 :

ECB(Homeotropic Electrically Controlled Birefringence) , 3 (Homogenous Electrically Controlled Birefringence) ECB ,
 ECB , (Applied Physics Letters) 20,199(1972)
 ECB , , JP-A-1-70

21 .
 2 ,
 가 HFE(Hybrid Field Effect) , TN-ECB(Twisted Nematic-Electrically Controlled Birefringence) , SCTN(Self-Compensated Twisted Nematic) , MTN(Mixed mode Twisted

Nematic)
TN-ECB (Japan Display) '89, p.192(1989) , SCTN JP-A-
10-090731 , MTN (Applied Physics Letters)68, p. 1455(1996)

(Proceeding of SPIE)3685,P.87(1999) (Proceeding of I
DW) '99, p.985(1999)

HFE 0 Vrms () 가 , 가 () 가 ,
(normally black) 0 Vrms () 가 ,
가 () 가 , (normally white)

JP-A-61-13885

가 JP-A-4-319910

1/4

1/4

JP-A-2-250026 US Patent 5,327,270 ,

(retardation) 0.25(, 1/4)

US Patent 5,576,854

, JP-A-1-7021

(Proceeding of SPIE) 3685, P.87 (1999) ,

, MTN

(

가

, TN-ECB

1

60

가

(追隨)

1

, 1/60 = 16.7

가

1

가

, TN-ECB

MTN

가

(retardation)

, MTN

MTN

(n)

d n

(d) ,

가

2

2d n

2

2

1

가

(flicker)

가

가

, 가

, 1

가

, 100%

가

가

가
가

1

가

가

retilt angle) 가 . 가 가 . (p

가 가 . 가 . 가 . (耐橫電界性) 가 . 가 .

() 4 1

50 90 0 10

80 50 90 90

45 90 0 100 -10 1

가 0 4 1 10

가,

(1)

1 1

(109), (104), (102)

(109) ()

(102) 2

(102) (103)

(104) (109) (102) 가 (104)

(104) (102) (103) s

(105), p (106)

108, 107

가

() (101) (102) (101) (10

2) (103)((103)') s (104) (109) (109)

s (104) (102) s

(104) (109) (103) p (102) (102)

(110) (103) p () () (103)

(103) s (103) ()

(109) 가 가 가 가 () 가 가 가 () ,
 2 가 가 가 가 () 가 가 가 () ,
 (109) (130) (131) (109) (104) (132)
 1 (109) (132) (132) (132)
 n (133) p (134), MOS(Metal Oxide Semiconductor) (135), (136),
 (137) (140)
 MOS (135) (141)
 (138) (132) (130)
 (131), (139)가 (139) (131) (130)
 (104) (109) (130) 1
 (109) (130) (104)
 , (104) 4 1 가 4 1 700nm 4 1 100nm
 175nm 가 400nm 700nm 4 1 100nm
 (2) 가
 2
 3
 3
 1 (120),
 2 (121), 1 2 (122) (正), (負)
 (122) 가 (120) (105 106) () (12
 3) 3 1 (120) (105)
 (123) 가
 (104) (107) (108) , (105 106) (123) (107) (105
) () (124a) 3
 (107) (107) (108) (108) (105 106) , 가
 (104) (107) (108) (108) (105 106)
 , (124b) (124b)
 , (131) (104) (131)

$J_{\infty} = \begin{pmatrix} a & b \\ -b^* & a^* \end{pmatrix}$ (1)

$a = \cos \varnothing \cos \beta + \frac{1}{\sqrt{1+\alpha^2}} \sin \varnothing \sin \beta - \frac{i\alpha}{\sqrt{1+\alpha^2}} \cos \varnothing \sin \beta$ (2)

$b = -\sin \varnothing \cos \beta + \frac{1}{\sqrt{1+\alpha^2}} \cos \varnothing \sin \beta - \frac{i\alpha}{\sqrt{1+\alpha^2}} \sin \varnothing \sin \beta$ (3)

$\alpha = \frac{d \Delta n}{\lambda} \frac{\pi}{\varnothing}$ (4)

$\beta = \varnothing \sqrt{1+\alpha^2}$ (5)

$J_{R_{\infty}} = R(\varnothing) J_{\infty} R(-\varnothing) R_{\varnothing} J_{\infty}$ (6)
 , R(ϕ) , Re 가 (R)

$R = 1 - \left(\cos^2 \beta + \frac{1-\alpha^2}{1+\alpha^2} \sin^2 \beta \right)^2 - 4\alpha^2 \left(\frac{\sin^2 \beta \sin 2\theta}{1+\alpha^2} + \frac{\sin \beta \cos \beta \cos 2\theta}{\sqrt{1+\alpha^2}} \right)^2$ (7)
 (R) (R=1) (7) 0

4a (7) R=1 (ϕ) d n/ R=1 100%가
 R=1 4a , R=1 100%가

$\partial R / \partial (d \Delta n / \lambda) = 0$ (8)
 $\partial^2 R / \partial (d \Delta n / \lambda)^2 > 0$ (9)

73 ($\emptyset = 73$)
 2 가 (B1, B2) ($\emptyset > 73$)
 B3 () 4a (B3) 4b 4a B1, B2 B3 4a B1, B2
 가 50 , 60 , 70 , 80 , 90
 (104) 4a 4b (124a) (201 210) 90
 80%가 () 가
 1% (100) 5a, 5b () 가 5
 (104) (p) (124a) 5a, 5b ()
 5a 가 (p) = 0 $p = 90$
 가 () 가 5Vrms
 6a 가 $p = 0$ 가 0.55 μm p 가 5
 6 (124a)(p) 0 가 10 p 6b $p = 90$
 μm p 가 85 가 (124a)(p) 90 p 80
 가 60 (104) (p) (124a) 7a, 7b ()
 7a (p) = 0 $p = 90$ 가 0 Vrms (124a)
 가 () 가 8a, 8b 가 5 Vrms
 8a 가 $p = 0$ p 0.55 μm p 가 8
 (124a)(p) 0 가 10 p 8b $p = 90$
 $0.55 \mu\text{m}$ p 가 86 가 (124a)(p) 90 p 80
 가 70 (104) (p) (124a) 9a, 9b ()
 9a (p) = 0 $p = 90$ 가 0 Vrms (124a)
 가 () 가 10a, 10b 가 5Vrms
 10a 가 $p = 0$ p 0.55 μm p 가 3
 4 (124a)(p) 0 가 10 p 10b $p = 90$
 $0.55 \mu\text{m}$ p 가 87 가 (124a)(p) 90 p 80
 가 80 (104) (p) (124a) 11a, 11b ()
 가 0 Vrms (124a)

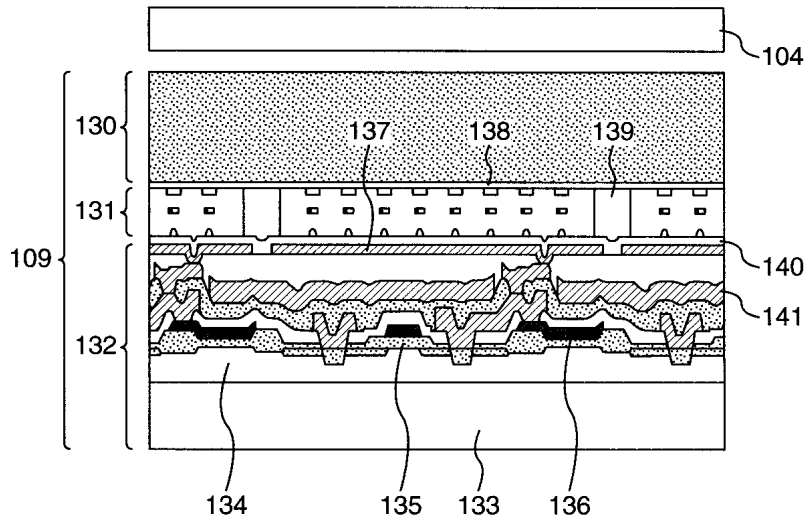
11a , (θ_p)=0 , θ_p , θ_p
 가 , 11b $\theta_p=90$ 가 가 , θ_p
 () 12a, 12b 가 5Vrms .
 12a 가 $\theta_p=0$ θ_p 0.55 μ m , θ_p 가 3
 (124a)(θ_p) 0 가 , 10 θ_p , 12b $\theta_p=90$
 θ_p 가 88 θ_p 87 가 , 0.55 μ m
 가 90 (124a)(θ_p) 90 θ_p 80 , 13a, 13b ()
 , (104) (θ_p)((124a))
 , 가 0 Vrms .
 13a , (θ_p)=0 , θ_p , θ_p
 가 , 13b $\theta_p=90$ 가 가 , θ_p
 () 14a, 14b 가 5Vrms .
 14a 가 $\theta_p=0$ θ_p 0.55 μ m , θ_p 가 0.5
 1 (124a)(θ_p) 0 , 10 θ_p , 14b θ_p
 , θ_p 가 89.5 θ_p 89 가 , θ_p
 =90 (124a)(θ_p) 90 , θ_p 80
 0.55 μ m
 , 가 , () 가 50 5 6 , 10 (12
 4b) , 2 (124a)가 0 10 , 80 90
 , (124b)가 0 10
 , 4 , 가 , 가
 , 5 10 , 가 70 ,
 가 14 () 가 70 가 ()
 , 9 () 가 () 8
 0% 50 90 , 가 ()
 70 , θ_p 0.5 6 , 가 0.55 μ m
 (3)
 3 15 3 , 0 , (123) 45
 , 16a 16b
 16a 16b (130)
 (138) , (132) , (137)
 (138) (Vcom) 가 16a (137)(
 (V1) , 16b (137) (V1, V2, V1 > V2) 가
 , 16a, 16b (160)
 16a ()가 , 16b
 가 , 16a (131) (150)
 , 16b (150)가
 , 가
 17 (151) (150) ,
 , (151) (150) t

가 , t () , 가 , 가 t 4 6 가 .
 4 , 6 가 - 가 18a 가 , 18a, 18b t 2 ,
) (0V) , t 가 가 () (3.5V) , 18a () ()
 18a, 18b t 가 가 () 가 ()
 19a 19b (104) () . 19a p 가 0
 19a , (124b) , 19b p 가 90 . 가
 0.55 μm , p 가 - 1 - 1.5 (1
 24a) 0 가 , p 가 . , 19b , p =90
 가 91 p 91.5 가 , 0.55 μm p .
 3 , (124a) 90 100 p 가 , ,
 20a, 20b (104) () . 20a, 20b ,
 (124a) p 0 - 2 , 90 92 가 ,
 , (124a) p - 1 - 1.5 , 91 91.5 가
 (4) , (124b) 1 1.5 가 가
 1 (301) , (102) , 21 (302, 303) 1 4
 (109R, 109G, 109B) , (104R, 104G, 104B), (304) (102)
 (301) (102) (302 303) , (102)
 (109R, 109G, 109B) (302 303)
 21 , (102) , (302 303) (304) ()
 1) . 가
 , (104R, 104G, 104B) (124a) .
 , 5 14 (104) (124b)
 4 0 (102) 10 가 (302, 303) ,
 , 4 (101) (102) (104) (302,
 303) , (301) (101) 가 .
 , . 2000 , p.92
 , 4 1 가 , 2, 3
 가 가 .

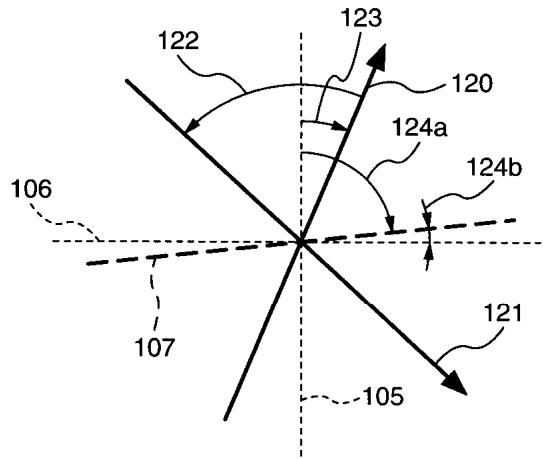
(57)

1.

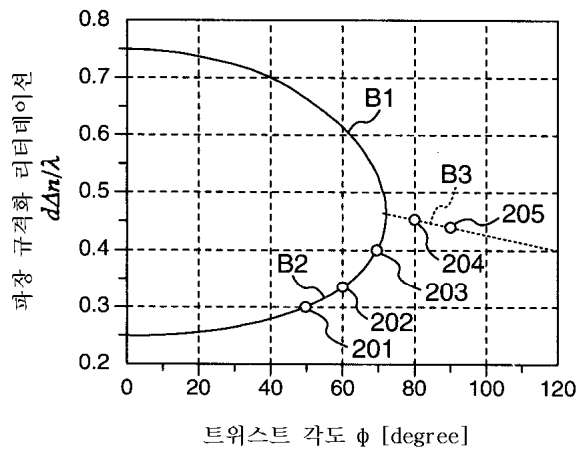
2



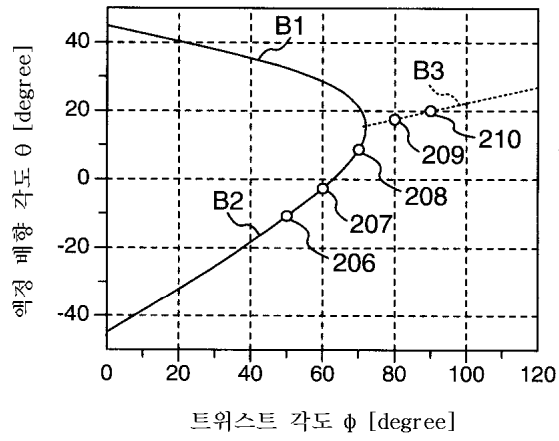
3



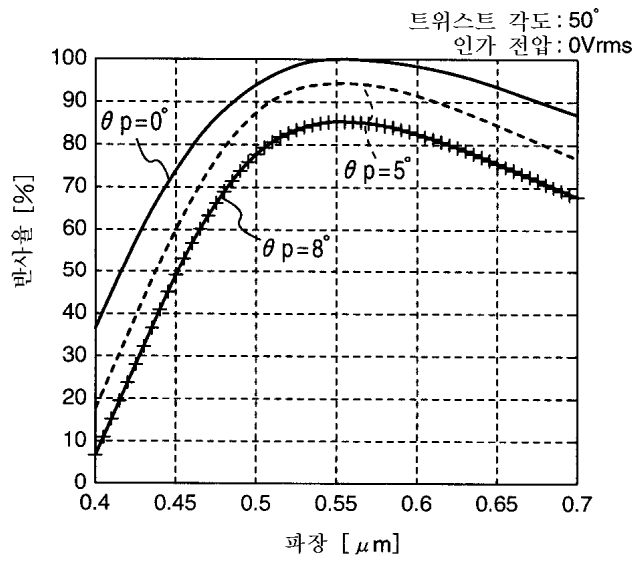
4a



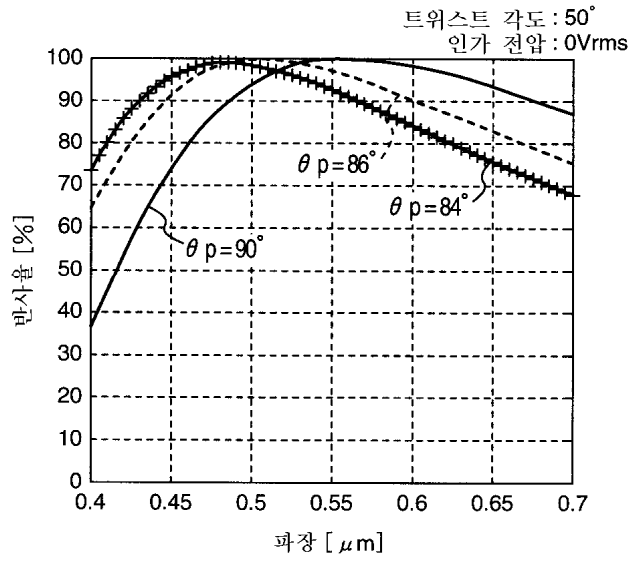
4b



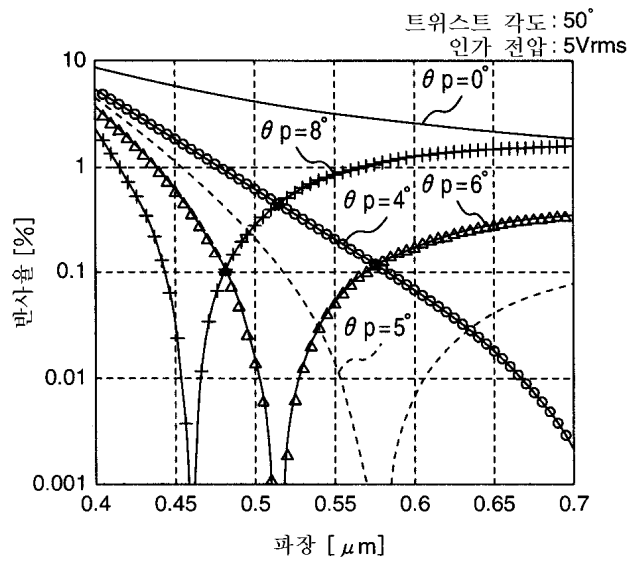
5a



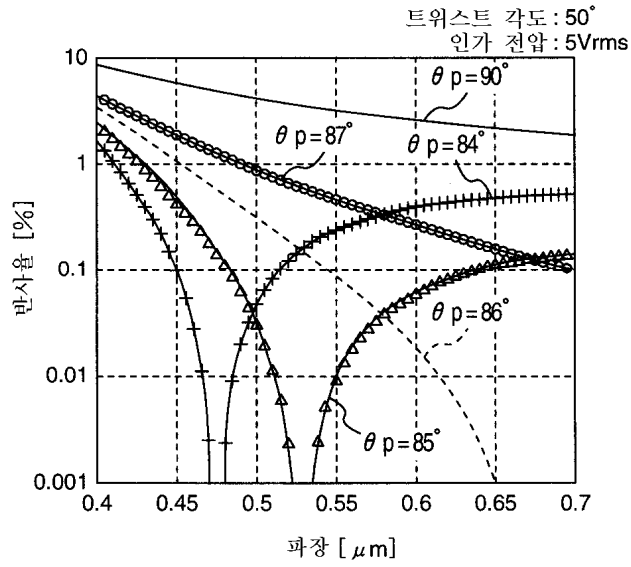
5b



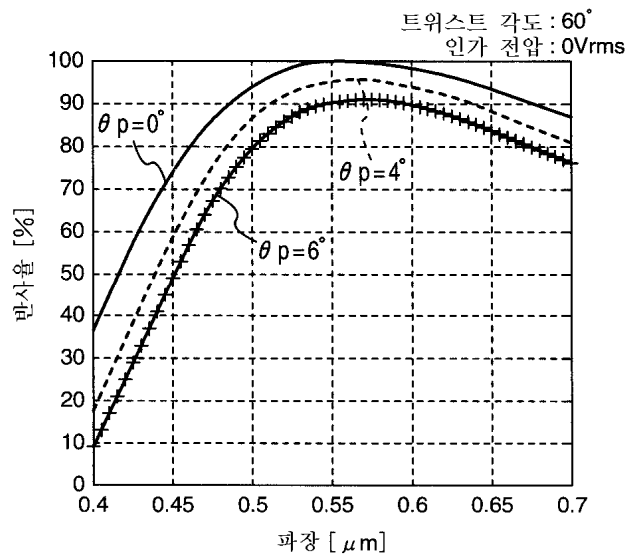
6a



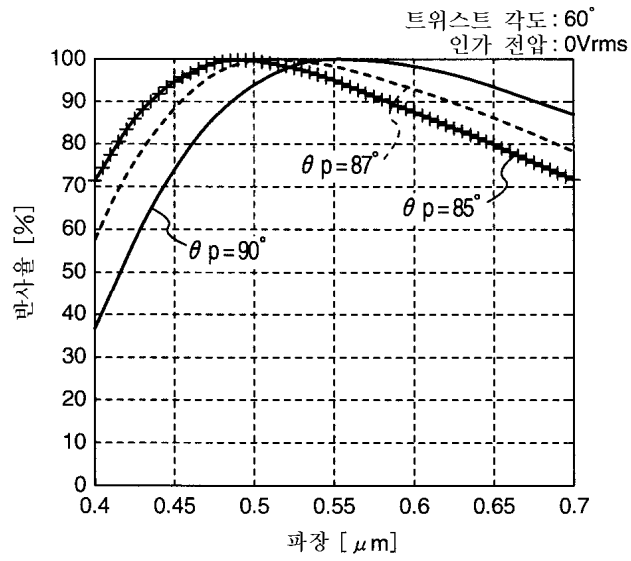
6b



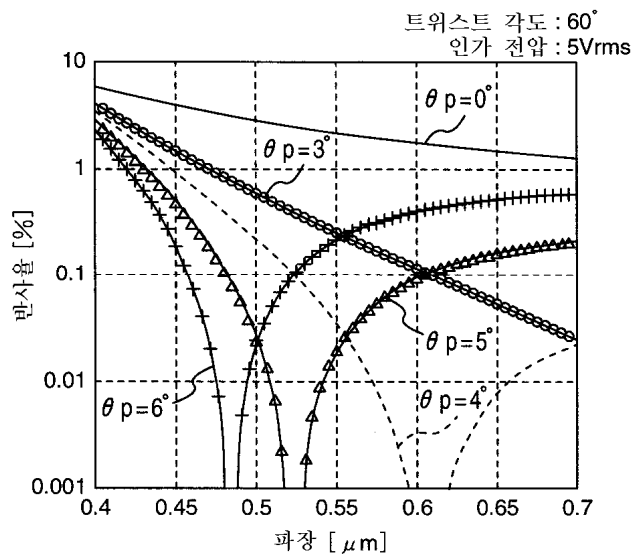
7a



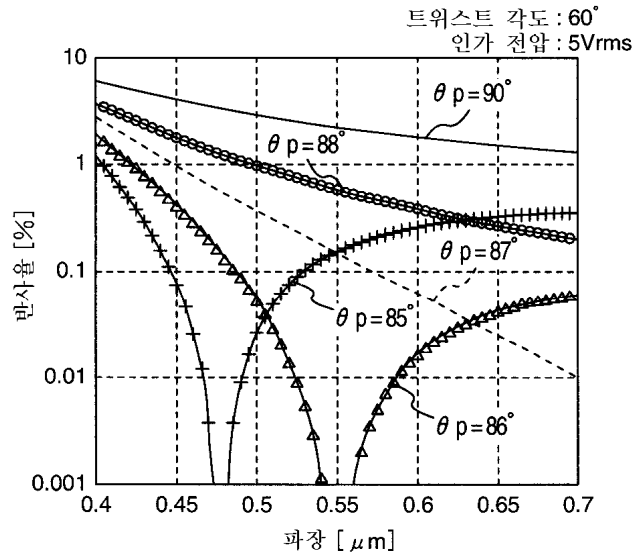
7b



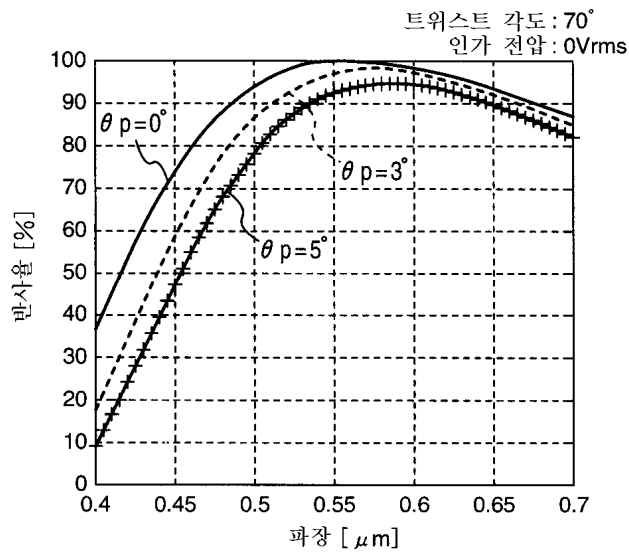
8a



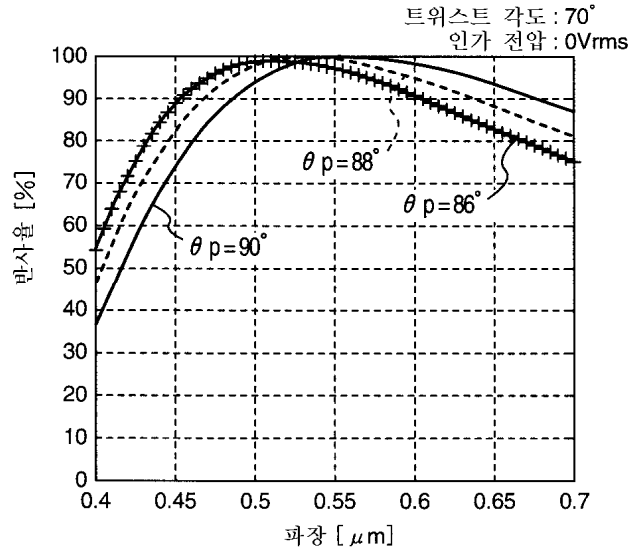
8b



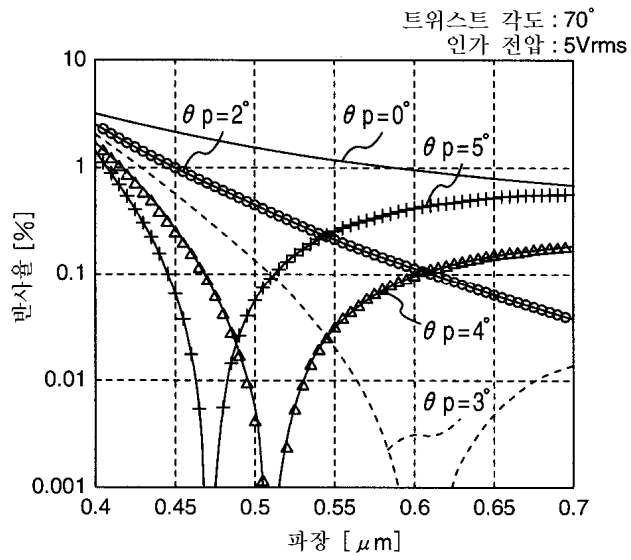
9a



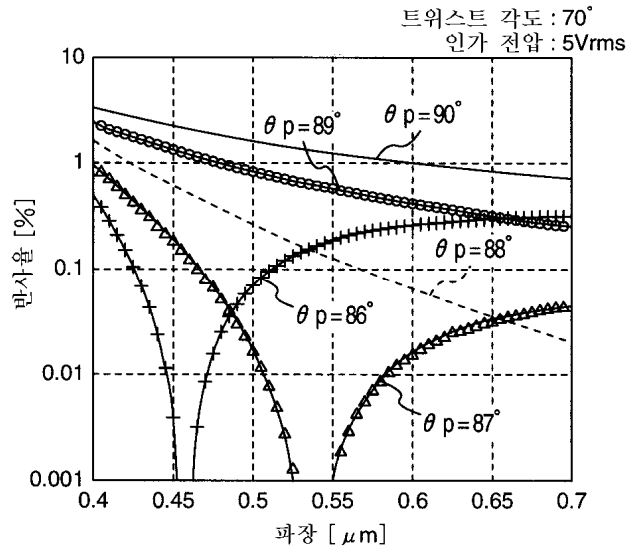
9b



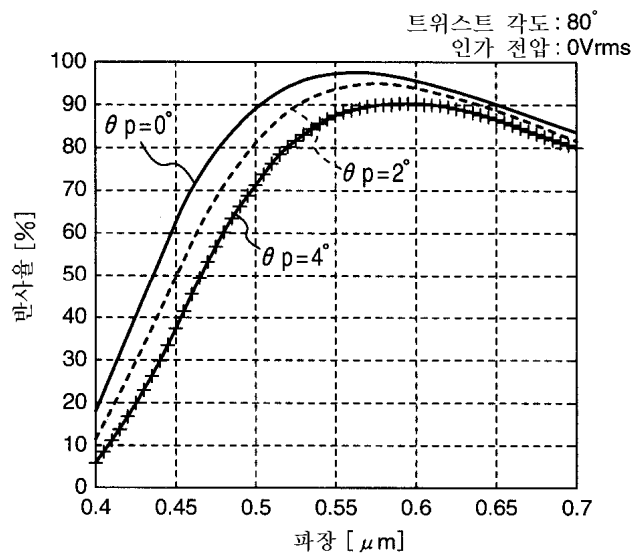
10a



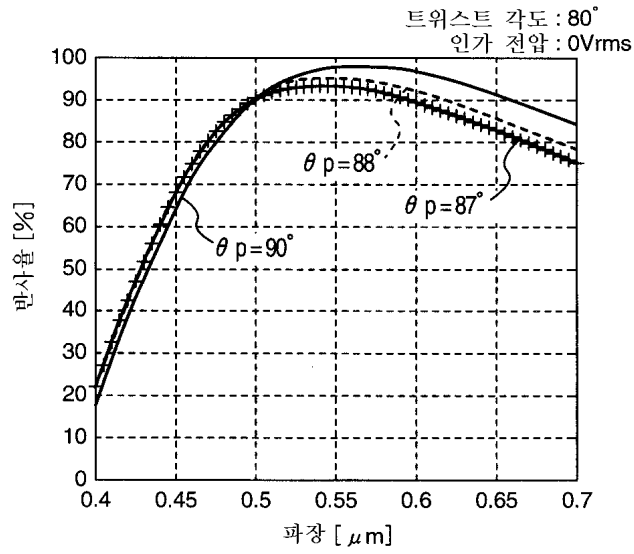
10b



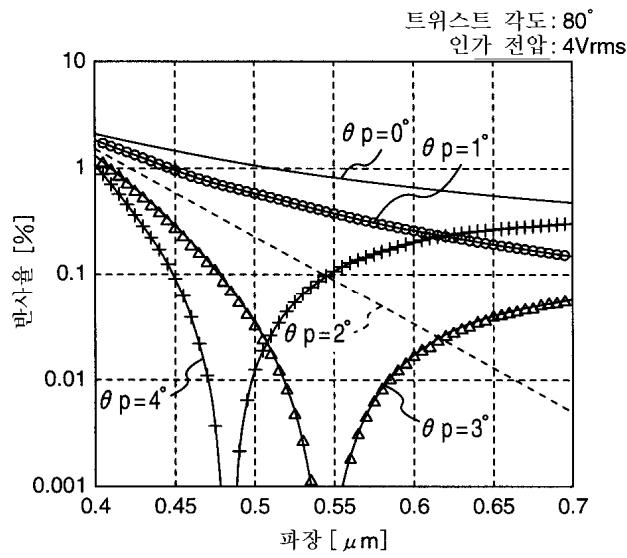
11a



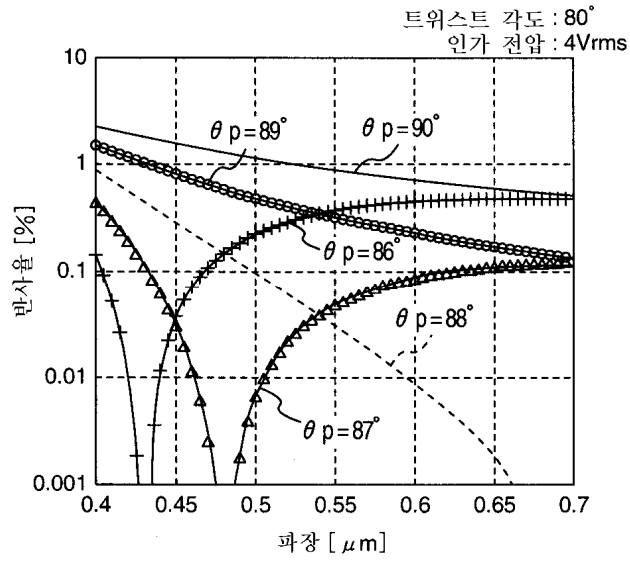
11b



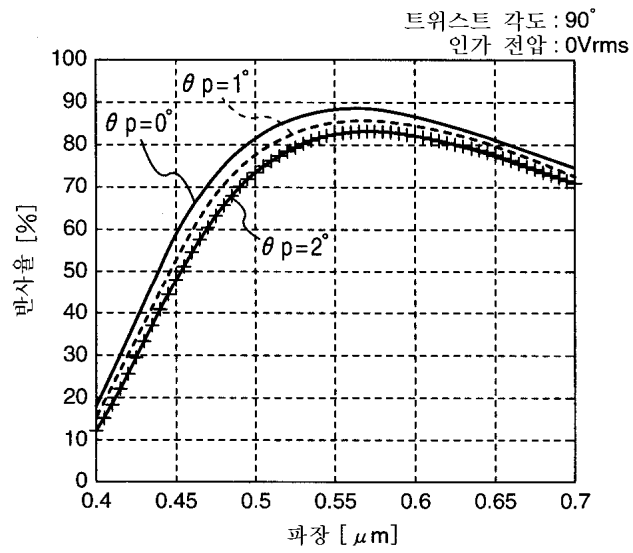
12a



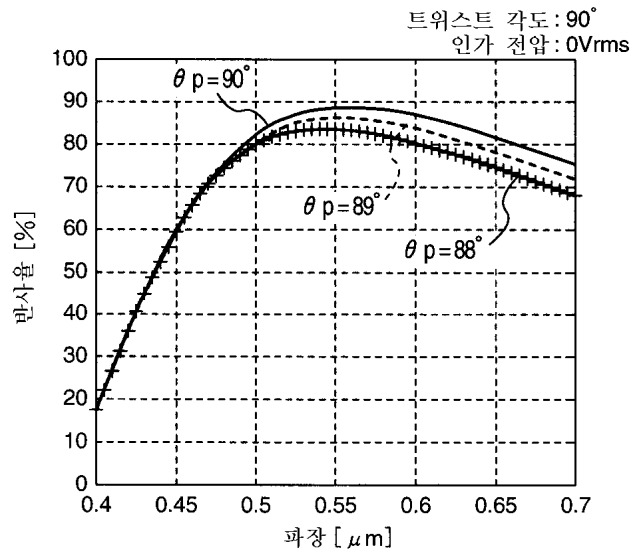
12b



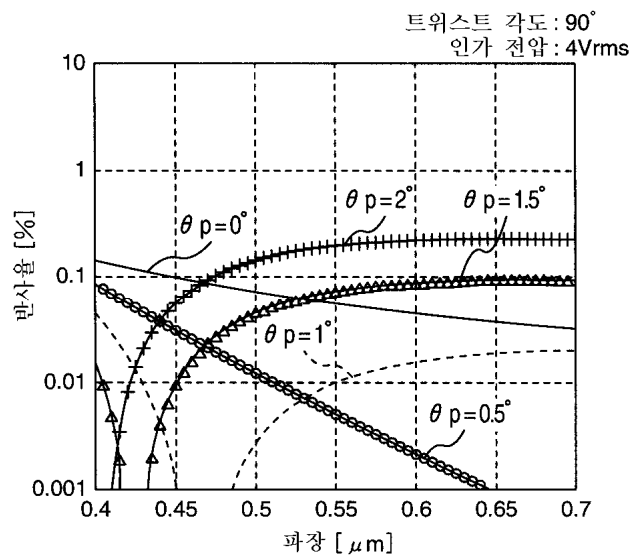
13a



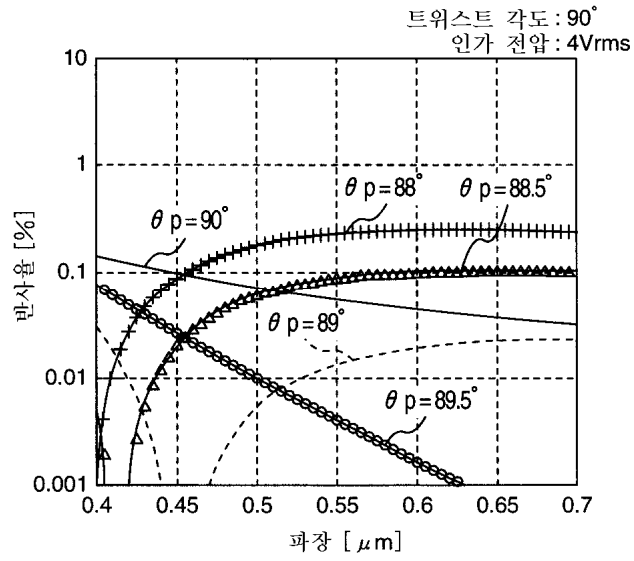
13b



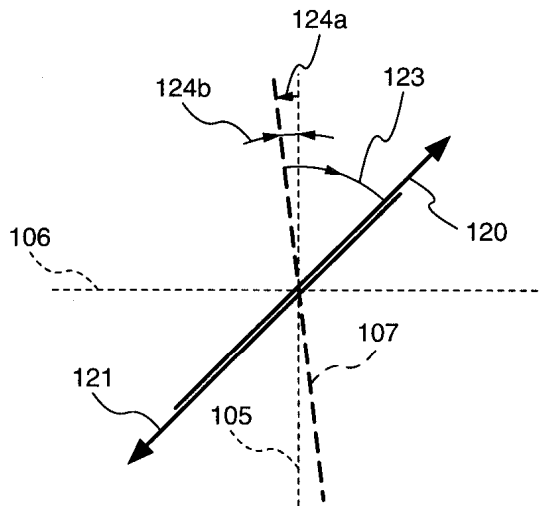
14a



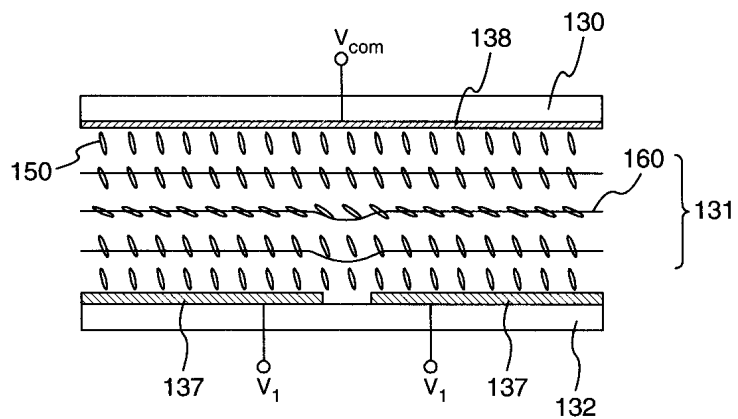
14b



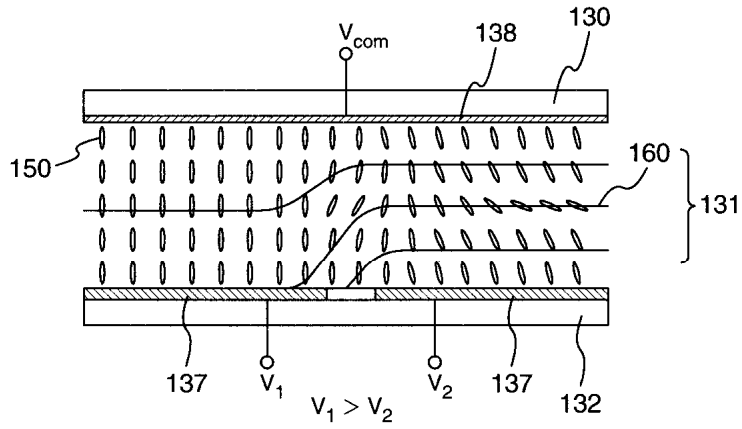
15



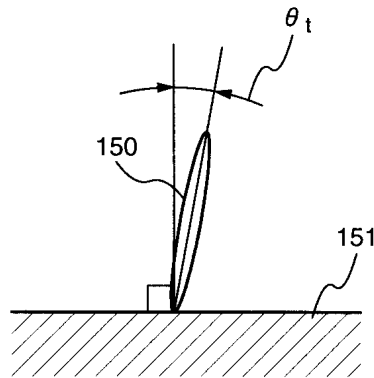
16a



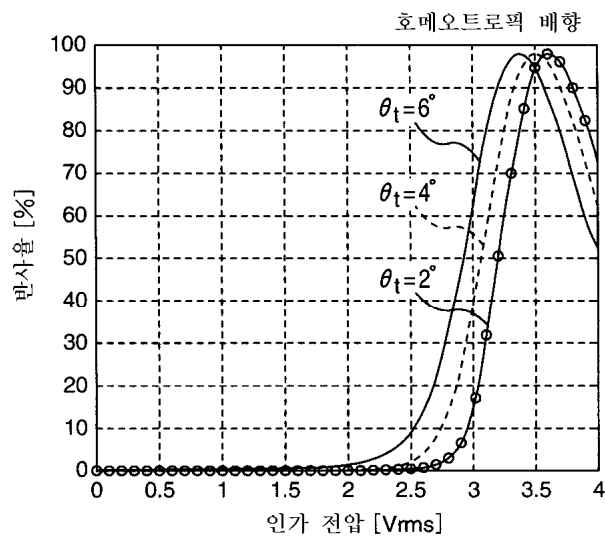
16b



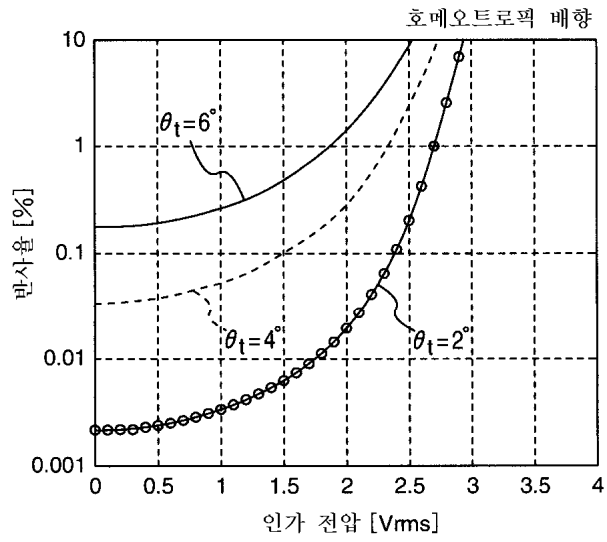
17



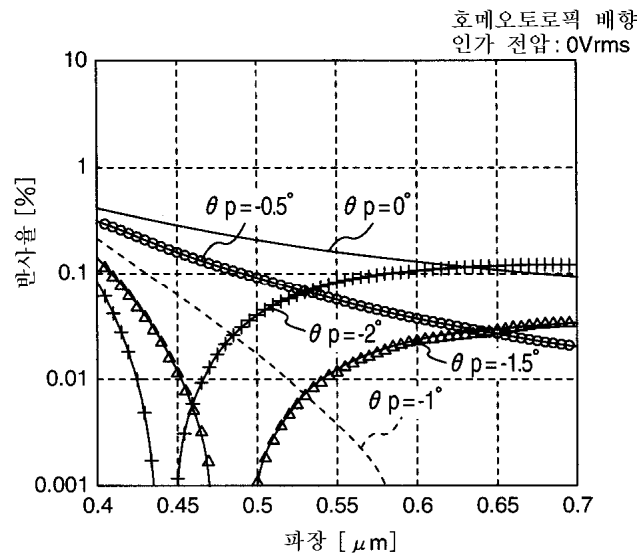
18a



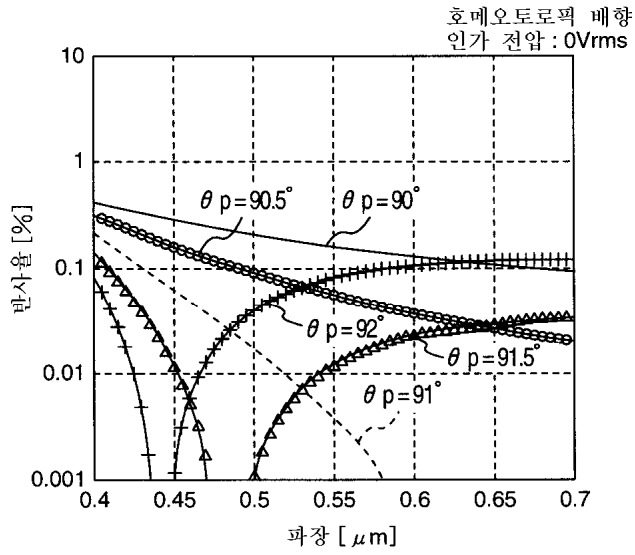
18b



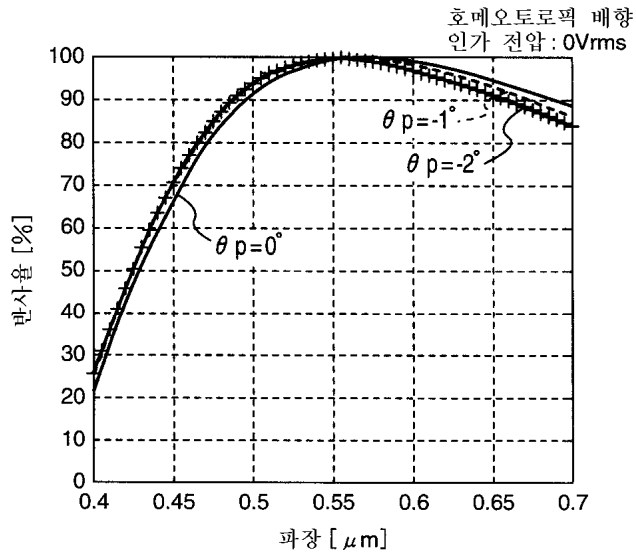
19a



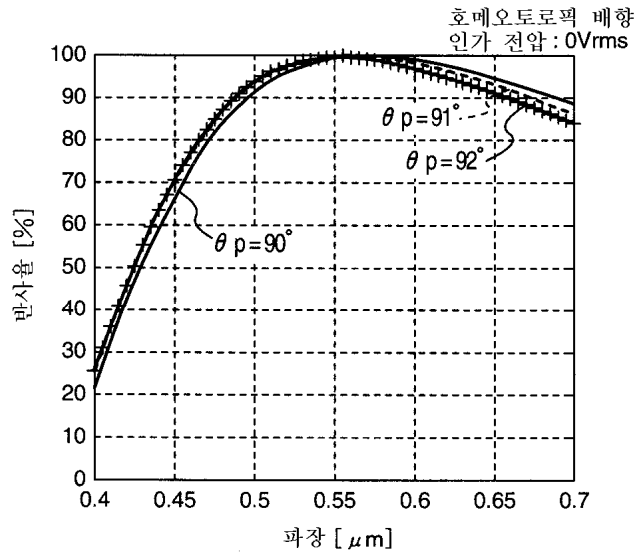
19b



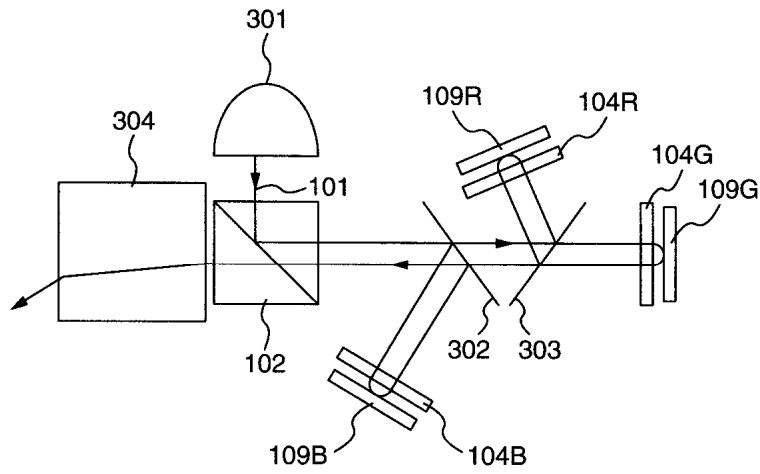
20a



20b



21



专利名称(译)	液晶显示装置和使用其的液晶显示装置		
公开(公告)号	KR100426750B1	公开(公告)日	2004-04-13
申请号	KR1020010052333	申请日	2001-08-29
[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	HIROTA SHOICHI 히로다쇼오이찌 AOTO KATSUhide 아오토가쯔히데 TSUMURA MAKOTO 쯔무라마꼬토 TAKEMOTO IWAO 다께모또이와오		
发明人	히로다쇼오이찌 아오토가쯔히데 쯔무라마꼬토 다께모또이와오		
IPC分类号	G02F1/139 G02F1/1335 G03B21/14 G02B5/30 G09F9/00 G02F1/13363 G03B21/00		
CPC分类号	G02F2413/01 G02F2202/40 G02F2413/08 G02F1/13363 G02F1/1393 G02F2203/02 G02F2001/133531 G02F2001/133638 G02F1/1396		
代理人(译)	CHANG, SOO KIL CHU, 晟敏		
优先权	2001003186 2001-01-11 JP		
其他公开文献	KR1020020060556A		
外部链接	Espacenet		

摘要(译)

本发明提供一种具有高速响应和高对比度的液晶显示装置和使用该液晶显示装置的显示装置。例如, 诸如偏振分束器的偏振元件和设置在反射液晶光阀之间的延迟板之间的相位差被设定为相对于入射光的波长的四分之一波长。并且, 延迟板的光轴(慢轴到快轴)和入射偏振光的偏振方向稍微大于0度。1 指数方面 液晶显示元件, 响应性, 液晶高度阀, 偏振分束器, 相位差, 光轴, 液晶显示器

