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2002 05 16(21) 10 - 2001 - 0069461
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3453

(71)

1 4 - 1

(72)

가 6 - 1 - 1

가 6 - 1 - 1

가 6 - 1 - 1

(74)

:

(54)

DVD

가 0.280 μ m

(列) 가

(NA)가 0.80~0.90

375nm~415nm

가 18nm~32nm

3

DVD, , , , , ,

1 (groove) ,

2 (pickup) ,

3 ,

4 (1, 7) RLL RF ,

5 8nm RF ,

6 32nm RF ,

7 RF 0.6 RF 1 ,

8 ,

9 RF 0.6 ,

10 (NA) (TP) (λ), (NA) (TP) ,

11 10 P1, P2, P3 ,

12 ,

13 ,

14 5% .

[]

11 12

13 15

16 17

18 19

(groove) (列) 가 ,

, DVD(Digital Versatile Disc) 가 .

, DVD - R(Digital Versatile Disc - Recordable) 가 .

DVD - RW(Digital Versatile Disc - Rewritable) DVD 가 $0.74\mu\text{m}$, $0.267\mu\text{m}$ () 가 25nm . DVD 4.7GB

MPEG2 2 가 .

DVD (land prepit)() , DVD (GV) , 1

가 , (GV) (GV) . , (M) .

가 , 2 4 (1)가 . 4

(1) DVD (GV) , , (1a, 1d) (外周) , (1a, 1c) (內周) .

DVD (spot) , DVD 4 (1a~1d)

(1a, 1d) (Ra, Rd) 가 (2) , (Ra, Rd) 가 , 가

(1b, 1c) (Rb, Rc) 가 (3) . 가 (2) 가 (3) 가 (4)

(3) (Rb, Rc) 가 , 가 (2) 가 (3) 가 (4)

, (4) 가 (radial) (push - pull) . ,

, RF (1a, 1b, 1c, 1d) . ,

가 (asymmetry)

0 ± 1 가 .

DVD - R/RW , , 30

(NA) ,

, NA , (λ) , 가 가 .

λ / NA . , NA , λ

DVD $\lambda = 650\text{nm}$ NA=0.6 ,

() 가 0.6mm .

가 , DVD - R/RW , 0.117 μ m/bit
 가 , 0.117 μ m/bit
 0.130 μ m/bit , 가 (1, 7) RLL
 , 86.7 μ m/bit가 (ISOM2000 Technical Digest(We - B - 01), ISOM2000 Techni
 cal Digest(Fr - M - 02)).

가 , DVD - R/RW (Gd)가 $\lambda/16n$ (λ
 , n)
 가 , DVD - R
 /RW (TP) , 가 .

, DVD - R/RW λ/NA
 , 가 .

, DVD

, 가 0.280 μ m
 가
 (NA)가 0.80~0.90
 375nm~415nm , 가 18nm~32
 nm .

, 80nm~240nm .

3 , 가 (11) , Ag - In - S
 b - Te , Zn - SiO₂
 (15) . (15) (12) (13)
 (TP) (Gd) (12) (B) (SP)
 (11) (B) 가
 (18) (19) (B)
 (17) .

, $\lambda = 405$ nm, NA=0.85, TP=0.30 μ m, Gw=100nm

2nm	(Gd)	가	,	0.280~0.325 μ m	18nm~3
	가	.	,	가	,

[illegible]

5 6 RF , (RF 0.6
) / (RF 1) (Good Area(%))
, DVD RF 0.6 ,
, RF 가 (Mr) 가 1 (Mp) 가 180
, (r) F (λ , NA, TP, Gd) , F (λ ,
NA, TP, Gd) 0.5 0.6 (TP) (Gd)

7. 7. 가 62.5% 가 , 18nm~32nm 가 .

3 AgInSbTe Zn - SiO₂
(15)
8 t1, t2, t3 Zn - SiO₂, AgInSbTe, Zn - SiO₂
P1, P2, P3

P1 $t_1=100\text{nm}$, $t_2=7\text{nm}$, $t_3=35\text{nm}$,

P2 $t_1=100\text{nm}$, $t_2=8\text{nm}$, $t_3=37\text{nm}$,

P3 $t_1=80\text{nm}$, $t_2=6\text{nm}$, $t_3=38\text{nm}$,

5 6 P1~P3 가

8 t1=95~105nm, t2=5~7nm, t3=35nm
800

9 , RF 0.6 가 32nm RF 가

2 5 6 , RF 0.6 가

7 9 , RF 5 6 , RF RF 0.6

$\lambda = 405\text{nm}$, $NA = 0.85$, $TP = 0.30\mu\text{m}$
 $NA = 0.80 \sim 0.690$, $\lambda = 375\text{nm} \sim 415\text{nm}$, $TP = 0.325\mu\text{m} \sim 0.280\mu\text{m}$
 (1) ~ (3)

$$0.28 \leq TP(\mu\text{m}) \leq 0.325 \dots (1)$$

$$375 \leq \lambda (\text{nm}) \leq 415 \dots (2)$$

$$0.8 \leq NA \leq 0.9 \dots (3)$$

가 18nm , 0.12
 TP, λ , NA (4)

$$8000TP(\mu\text{m}) - 9\lambda (\text{nm}) + 3600NA \geq 1745 \dots (4)$$

(1) ~ (4) , 18nm 가

10 (1) ~ (4) , (λ), (NA) (TP)
 (4) 10 P1, P2, P3

10 NA, λ , TP (1) ~ (4) 10 P1, P2,
 P3 11 , RF 0.6
 P1 (TP=0.28 μm , NA=0.8) 32nm P2 ($\lambda = 415\text{nm}$, NA=0.8)
 18nm , 60% , 10 (1)
 ~ (4) 32nm 가 50% , 가

0.12 , DVD - R/RW RF
 (PPa) $0.183 \leq PPa \leq 0.73$ (PP amplitude)
 (simulating) , 12 (PP)
 0.12 , PPa

, (TP)가
 () 가 18nm
 RF 가 32nm
 8nm~32nm 가 1
 가, RO
 M
 ROM
 가 $\lambda/4$ (58 4p - Z
 E - 7, 1997 10 , (秋田)).
 가 (偏倚)
 (Gw) 가
 2 , 4 (1) (Rb+Rd) (Rc+Ra) (
) , 13
 0 $\pm TP$ T1, T2

$$= (T1 - T2)/(T1 + T2)$$
 14 5%
 (1) 32nm (2)
 18nm
 0.2 가 , 14 (Gw) 50nm
 $\sim 260nm$ 80nm~240nm
 , 8
 , 2

DVD - R/RW λ /NA 18nm~32nm
 가 RF
 50nm~260nm DPD()
 DPD

(57)

1.

;

가 $0.280\mu\text{m}$ (列) 가

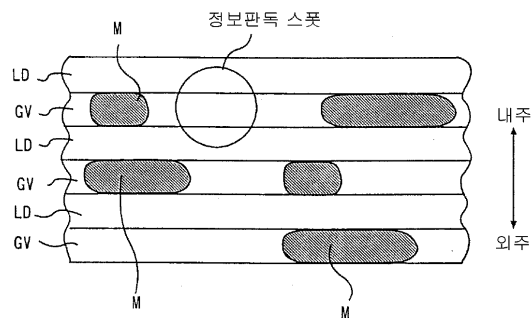
(NA)가 0.80~0.90
 375nm~415nm 가 18nm~32nm

2.

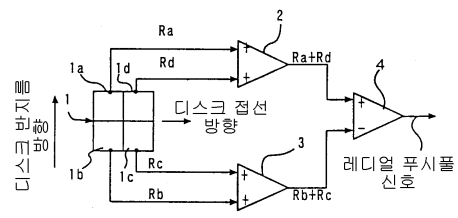
1 ,

80nm~240nm

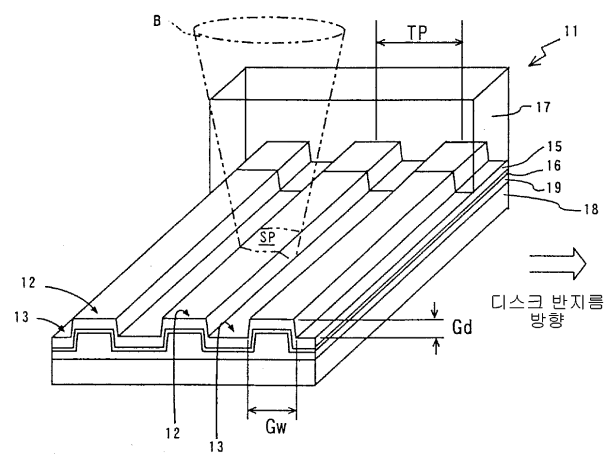
1



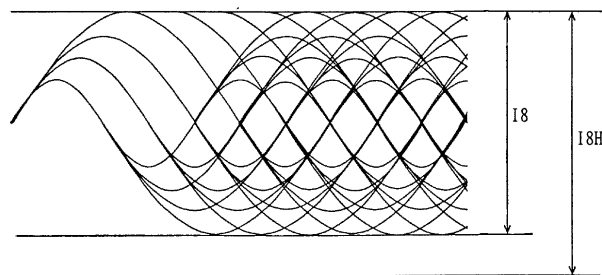
2



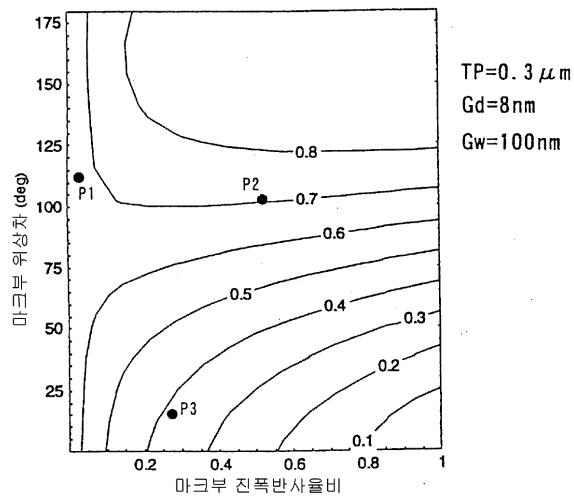
3



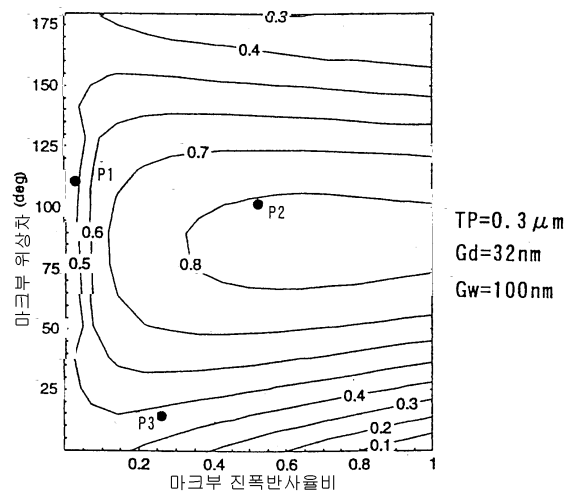
4



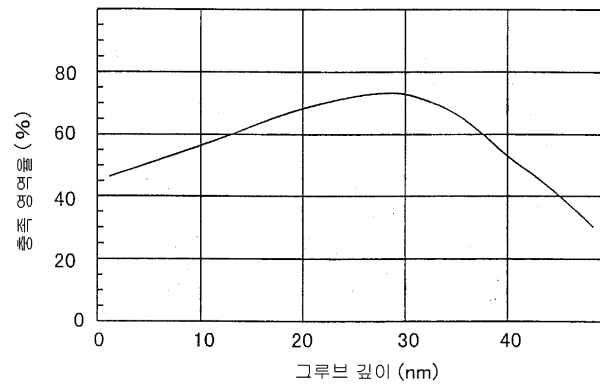
5



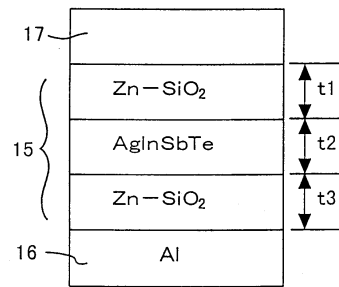
6



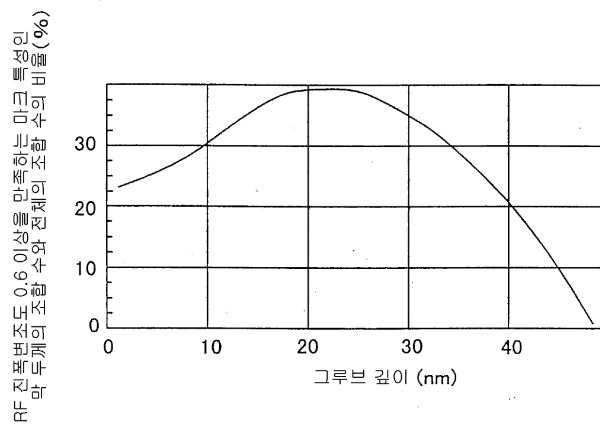
7



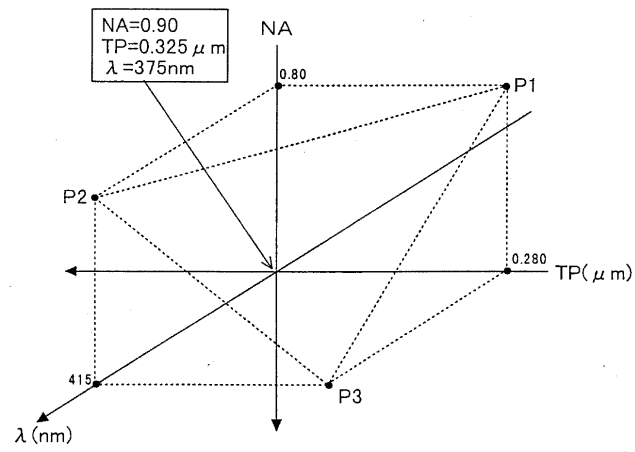
8



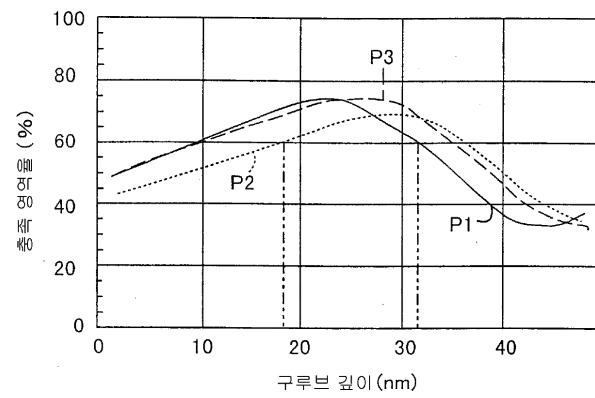
9



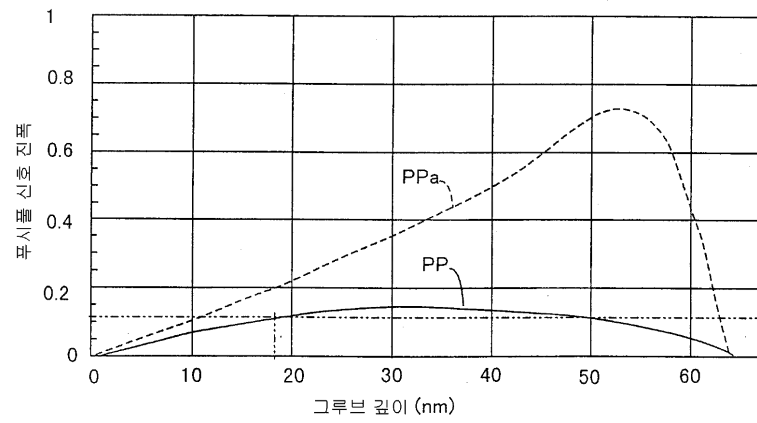
10



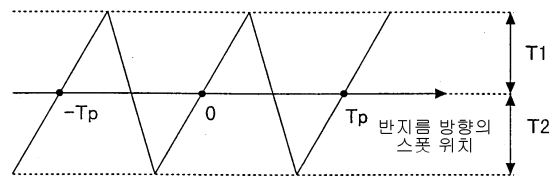
11



12



13



14

