

(19)
(12)

(KR)
(A)

(51) 。 Int. Cl.⁷
G02F 1/133

(11)
(43)

10-2004-0023241
2004 03 18

(21)

10-2002-0054925

(22)

2002 09 11

(71)

416

(72)

331

110 802

(74)

:

(54)

.

가 , RGB , RGBW , RGBW , RGBW , 3

, RGBW 4 , RGB , RGBW

,

3a

, LCD, 가, RGBW

1

1

.

2

2

.

3a	3b	3	.
4a	4b	4	.
5	4		.
6	5	- '	.
7			.
8	7		.
9			.

가

가

가

,

(R:red), (G:green), (B:blue) 가

가 ,

가

(), () ,

가

가 .

(R), (G), (B)

(stripe) ,

(R),

(G), (B)

(mosaic) ,

(R), (G), (B)

(delta)

(R), (G), (B)

(dot)

가

(R), (G), (B)

(R), (G), (B)

가 ,

가 1/3

가

[illegible]

[illegible]

.
 3a 3b 3 가 .
 , 3a 3b 가 , 3 , 1 ,
 , , 1/4 .
 , 3a , 1 ,
 가 .
 , 3b , ,
 (, ,) 가 ,
 , , 가 . (capacitive load)
 3 가 ,
 가 .
 4a 4b 4 가 .
 4a 4b , 4 , 2 ,
 , 가 , 2 ,
 , 4a , 3 ,
 , 가 , 가 ,
 , 가 , 가 ,
 , 4a , 2 ,
 , 4b , 3 (,
 ,) ,
 , 가 4 .
 5 가 4
 . 6 5 - ' .
 5 , 4 4b , 가
 . 가 , 가 4b ,
 가 4b .
 , 5 , 가 (,
 , 121) (121) (171) (171) (121) (121)
 B, R, G,) (121) (121) (171) (171) (121) (121)

1) (123) (171) (173) (123) 가
 (173) (175) (150) (171)
 (190) .
 (121) (190) (177) (121) (187) (
 177) (190) (121) (177)
 (177)
 (175) (190)
 (180, 5 6) (181) (177)
 (171) (171) (179)가
 (171)
 (100)
 (121), (121)
 가 (125) 가 30 ° 90 °
 (123) .
 (100) (SiN_x) (140)
 (125) (140) (150)
 (150) n n+
 (160) (150)
 (171)
 (160) (140)
 (121) (171), (171) (160)
 가 (173), (171) (173)
 (179), (173) (123) (173)
 (160) (175)
 가 (150) (180) (180)
 (175) (179) (185, 189) (180) SiNX (140)
 (125) (182) (180)
 /SiNX
 (180) (181) (175)
 (190) (180) (182, 189) (125)
 (179) (95) (97)가
 (190) 5 6 (121)
 (121, 125, 123) 가
 1 3
 4 (5 6)
 1 4
 7
 (200) 7 (100) (400),

(500) (600) .

(100) 가 (G₁-G_n, D₁-D_m) (pixel)

(C_{lc}) (G₁-G_n, D₁-D_m) (switching element)(Q) (G₁-G_n, D₁-D_m)

(D₁-D_m) (C_{st}) (data signal)

(Q) (G₁-G_n) (C_{lc}) (C_{st})

(color filter)가 1 4 가 4

(600) LCD (Hsync) R, G, B (200)

(Vsync), (300)

(600) (200) 가

(OE) (CPV) (STV), (200) (enable)

(600) (300) (Hstart), [R(0:N), G(0:N), B(0:N)] (300) 가

(LOAD) (300) (HCLK [R, G,

B] [R, G, B, W] (600) 가

8

(600) 8 RGBW (602), RGBW (603) (604) (603) (OPC) (600)

(600)

(graphic controller)(RGB (R, G, B) (IPC) , RGB

(600) RGBW

(600) (601)가 RGB RGBW (

half-tone) RGBW R, G, B, , RGB 가 RGB

RGB RGBW

(601) RGB RGBW 가 RGBW R

가 GBW (602) 127 (W=0, RGB=255), (W=1, RGB=

254), ..., (W=255, RGB=0) 256가 가 (redundancy)

가

, RGB W

RGBW

(602)
(W₀) , (R₀, G₀, B₀)

(601) RGBW

$$W_0 = W + \text{Min}(R, G, B)$$

$$R_0 = R - \text{Min}(R, G, B)$$

$$G_0 = G - \text{Min}(R, G, B)$$

$$B_0 = B - \text{Min}(R, G, B)$$

W

RGB

, TN(twisted nematic)

RGB 가

B=127)

(W=0, RGB=255)

127
(W=255, RGB=0)

(W=127, RG

가 TN

(601)

RGBW

W

RGB

, W

RGB

W

W

, W

=0)
55, RGB=0)

W
(normally black mode)

RGB

127

(normally white mode)

, (W=255, RGB
(W=2

) , (R₀, G₀, B₀)

, W 가

가 RGB
RGBW

(W₀

$$W' = \text{Min}(W_0, 255)$$

$$R' = R_0 + \text{Max}(0, W_0 - 255)$$

$$G' = G_0 + \text{Max}(0, W_0 - 255)$$

$$B' = B_0 + \text{Max}(0, W_0 - 255)$$

, W 가

가

RGBW

(R₀, G₀, B₀)

, W가

가

RGB

RGBW

$$W' = W_0 - \{255 - \text{Max}(R_0, G_0, B_0)\}$$

$$R' = R_0 + 255 - \text{Max}(R_0, G_0, B_0)$$

$$G' = G_0 + 255 - \text{Max}(R_0, G_0, B_0)$$

$$B' = B_0 + 255 - \text{Max}(R_0, G_0, B_0)$$

(uniform) 가 , W RGB (intensity)가 (:TV RGB)
 , W RGB
 , W RGB
 W RGB (R₀, G₀, B₀) , RGBW (W₀) ,

$$W' = \{W_0 + \text{Average}(R_0, G_0, B_0)\}/2$$

$$R' = R_0 + \{W_0 - \text{Average}(R_0, G_0, B_0)\}/2$$

$$G' = G_0 + \{W_0 - \text{Average}(R_0, G_0, B_0)\}/2$$

$$B' = B_0 + \{W_0 - \text{Average}(R_0, G_0, B_0)\}/2$$

RGBW W , 4
 RGBW , RGBW가 (255) RGBW (602) RGBW가 (603) (604) (OPC) RGBW (300) (300) RGBW 4 RGB 3 (602)가 RGBW (reorganization) (300) , (604) 1/3가 (604) (pixel clock) , 가 (IPC) 4/3 (OPC) , 9 , 1 3 RGBW 가 9 (602) RGBW가 (R₀ G₀ B₀ W (603) (604) (OPC) , 4/3 가 (OP C) RGB R₀ G₀ B₀ W₀ R₁ G₁ B₁ W₁ R₂ G₂ B₂ W₂ , ...

.
 , 2 4 RGBW가 2 RGBW , 가
 , RGBW가 2 RGBW .
 , $R_0 G_0 B_0 W_0, R_1 G_1 B_1 W_1, R_2 G_2 B_2 W_2, \dots$ RGBW 가
 가, (604) (OPC) $G_0 R_0 G_1, R_1 G_2 R_2, \dots, R_{N-2} G_{N-1} R_{N-1}$
 $2 G_{N-1} R_{N-1}$, $B_0 W_0 B_1, W_1 B_2 W_2, \dots, W_{N-2} B_{N-1} W_{N-1}$,
 (603)가 가 RGBW
 .
 .
 (300) (600) RGBW (300)
 (Hstart) 가 RGBW ,
 가 (100) , TFT 가 .
 (200) 가 (600) 가 TFT
 가 ,
 , 가 ,

, RGBW 4

, RGBW W
 , RGB RGBW
 , RGBW (;)
 RGBW , .

(57)

1.

2.

3.

1 2

4.

1 2

5.

1 2

6.

가 RGBW ;

가 RGB RGBW , RGBW

가 RGB, RGBW, RGBW

7.

6

가	RGB	RGBW	:
		RGBW	;

RGBW ;

RGBW 가

;

8.

7 ,

, (W₀) RGBW (W₀) , (R₀, G₀, B₀) RGBW

$$W' = \text{Min}(W_0, 255)$$

$$R' = R_0 + \text{Max}(0, W_0 - 255)$$

$$G' = G_0 + \text{Max}(0, W_0 - 255)$$

$$B' = B_0 + \text{Max}(0, W_0 - 255)$$

W', R', G' B':

9.

7 ,

, (W₀) RGBW (W₀) , (R₀, G₀, B₀) RGBW

$$W' = W_0 - \{ - \text{Max}(R_0, G_0, B_0) \}$$

$$R' = R_0 + - \text{Max}(R_0, G_0, B_0) \}$$

$$G' = G_0 + - \text{Max}(R_0, G_0, B_0) \}$$

$$B' = B_0 + - \text{Max}(R_0, G_0, B_0) \}$$

W', R', G' B':

10.

7 ,

, (W₀) RGBW (R₀, G₀, B₀) (W₀) , (R₀, G₀, B₀) RGBW

$$W' = \{W_0 + \text{Average}(R_0, G_0, B_0)\}/2$$

$$R' = R_0 + \{W_0 - \text{Average}(R_0, G_0, B_0)\}/2$$

$$G' = G_0 + \{W_0 - \text{Average}(R_0, G_0, B_0)\}/2$$

$$B' = B_0 + \{W_0 - \text{Average}(R_0, G_0, B_0)\}/2$$

W', R', G' B':

11.

7,

RGBW

가 3

12.

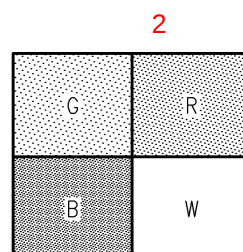
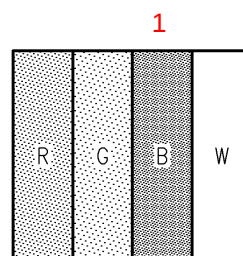
가

가

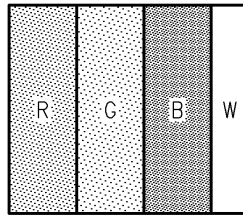
a) 가 RGB RGBW , RGBW ;

b) _____ ;

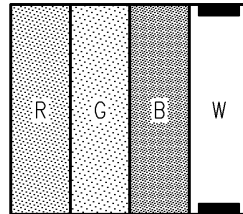
c) RGBW



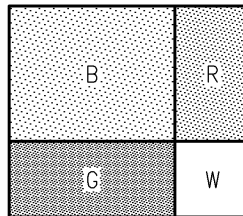
3a



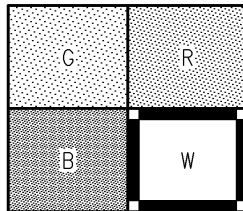
3b



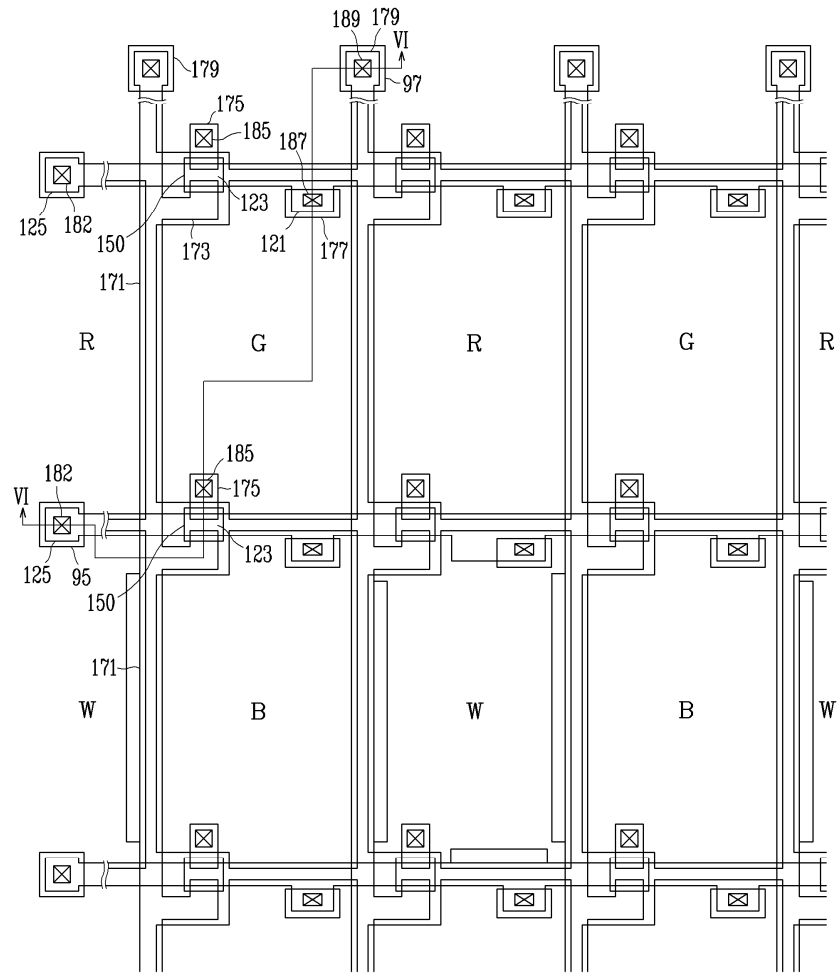
4a

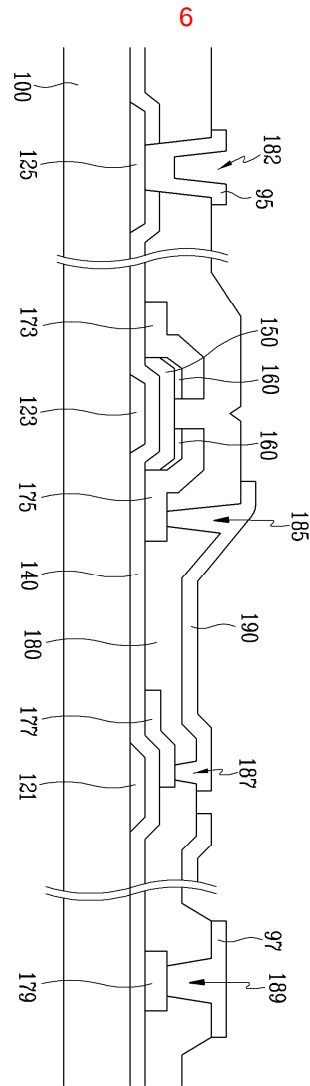


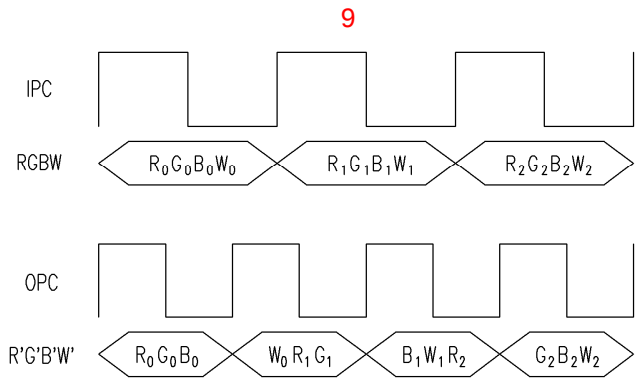
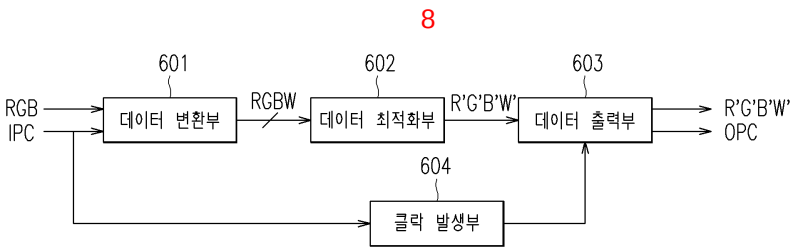
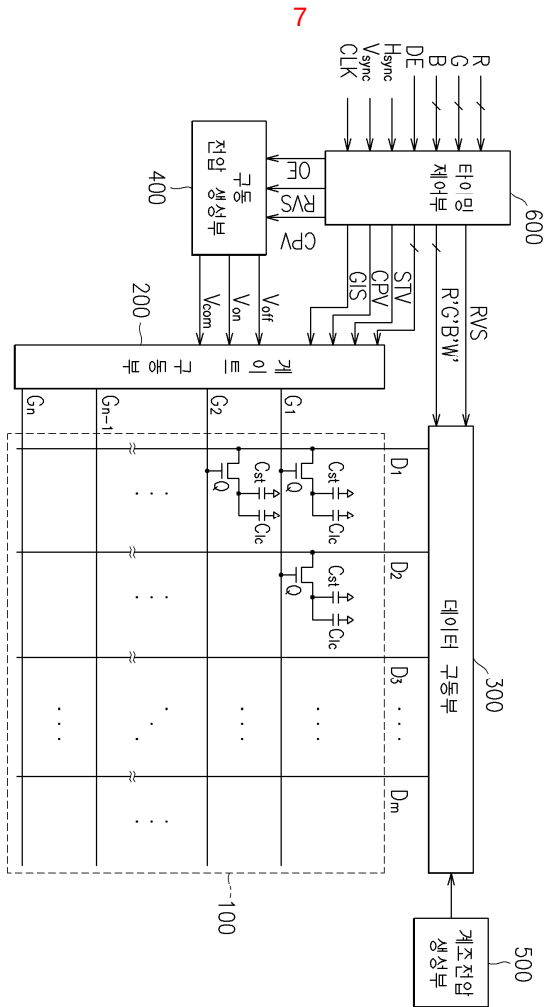
4b



5







专利名称(译)	液晶显示装置及其驱动装置		
公开(公告)号	KR1020040023241A	公开(公告)日	2004-03-18
申请号	KR1020020054925	申请日	2002-09-11
[标]申请(专利权)人(译)	三星电子株式会社		
申请(专利权)人(译)	三星电子有限公司		
当前申请(专利权)人(译)	三星电子有限公司		
[标]发明人	LEE BAEKWON 이백운		
发明人	이백운		
IPC分类号	G02F1/133		
CPC分类号	G02F1/133 G02F1/136286 G02F1/1368 G02F2201/123 G09G3/3413 G09G3/3614		
其他公开文献	KR100895304B1		
外部链接	Espacenet		

摘要(译)

液晶显示装置及其驱动装置技术领域本发明涉及液晶显示装置及其驱动装置。根据本发明的液晶显示装置形成一个点，该点是用于在图像中显示红色，蓝色，绿色和白色像素的基本单元。然后，从外部施加的RGB图像信号被转换为RGBW图像信号，并且转换的RGBW图像信号被优化并提供给数据驱动器。此时，当向数据驱动器提供RGBW图像信号时，可以以三个像素为单位提供数据。根据本发明，通过使用RGBW的四个像素显示图像，可以进一步提高光效率。因此，可以进一步降低功耗。此外，也可以从RGB数据来计算优化的RGBW数据，能够有效地降低液晶显示装置的电力消耗，以减少灰度等级反向的特性变化时，它能够改善图像质量。图3A 指数方面 像素阵列，LCD，亮度增加，RGBW

