

(19)  
(12)

(KR)  
(B1)

(51) 。 Int. Cl. 7  
H04N 9/64

(45)  
(11)  
(24)

2002 04 09  
10 - 0331839  
2002 03 26

(21) 10 - 2000 - 0002067  
(22) 2000 01 17

(65) 2001 - 0075757  
(43) 2001 08 11

(73)

20

(72)

68 - 7 204

(74)

:

(54)

R.G.B

R,G,B

가

3

(tint)

1  
 2 1 CSC  
 3 1  
 \*  
 1: 2:  
 3 - 11, 20, 21: 12 - 14: 가  
 15 - 18: 19:

가 NTSC  
 가  
 NTSC (Brightness), 가 (Saturation) 가 (Hue), (Contrast), 가

CSC(Color Space Converter) 가 CSC 가  
 1 x n R.G.B n x n 1 x n (sine theta value)  
 (cosine theta value) n x n

가 1 x n R,G,B n x n

1 3 CSC(color space converter)

1) CSC(2) (1) CSC CSC (sine theta value) (1) CSC(2) (R,G,B)

(1) CSC(2) 가 (Y) (C) CSC(2)

(C:chrominance) (Y: luminance) (C) (Y) (color spaces) YCbCr 가 YCbCr RGB CSC(color space converter)(2) RGB

1, 2, 3 ITU - R BT. 709

1

$$Y = 0.2125R + 0.7154G + 0.0721B$$

2

$$Cb = 0.5(B - Y) / 1 - 0.0721$$

3

$$Cr = 0.5 (R - Y) / 1 - 0.2125$$

2 1 CSC(2) YCbCr (coef1) RGB (Y) 1 (3), 2 (coef2) (Cb) CSC(2) 1 (coef3) (Cr) 3 (5), 4 (coef4) (Y) 2 (4), 4 (6), 5 (coef5) (Cb) 5 (7), 6 (coef6) (Cr) 6 (8), 7 (coef7) (Y) 7 (9), 8

(coef8) (Cb) 8 (10), 9 (coef9) (Cr)  
 9 (11), 1 3 (3,4,5) 가 (G) 1  
 가 (12), 4 6 (6,7,8) 가 (B) 2 가  
 (13), 7 9 (9,10,11) 가 (R)  
 3 가 (14) . 1 9 CSC  
 (1) . 3 x 3 11  
 (precision) . 1, 2, 3 ,  
 256 . 2  
 8 , 256  
 MSB(most significant bit) . 2 4 .

4

$$\begin{pmatrix} G \\ B \\ R \end{pmatrix} = \begin{pmatrix} CSC_{coef1} & CSC_{coef2} & CSC_{coef3} \\ CSC_{coef4} & CSC_{coef5} & CSC_{coef6} \\ CSC_{coef7} & CSC_{coef8} & CSC_{coef9} \end{pmatrix} \begin{pmatrix} Y \\ Cb \\ Cr \end{pmatrix}$$

4 (CSC) ITU  
 - R BT. 709 ( YCbCr RGB :High Definition Television) NTSC  
 ITU - R BT.601 가  
 RGB YCbCr YUV, YIQ YDbDr 가  
 3 x 3  
 (Cb)(Cr) (Y)  
 (Cb)(Cr) 5

5

$$Cb = Cb * \cos \theta + Cr * \sin \theta$$

$$Cr = - Cb * \sin \theta + Cr * \cos \theta$$

5 (Y) (YCbCr) 6

6

$$\begin{pmatrix} Y' \\ Cb' \\ Cr' \end{pmatrix} = \begin{pmatrix} 1 & 0 & 0 \\ 0 & \cos \theta & \sin \theta \\ 0 & -\sin \theta & \cos \theta \end{pmatrix} \begin{pmatrix} Y \\ Cb \\ Cr \end{pmatrix}$$

CSC 4 6 3 x 3 가  
 , CSC 가  
 CSC 가  
 CSC 가 CSC 가 CSC 가

CSC

CSC(2) 가 4, 6 가 (YCbCr) (1) RGB 6 RGB (Y'Cb'Cr') CSC(2) CSC 7

7

$$\begin{pmatrix} G \\ B \\ R \end{pmatrix} = \begin{pmatrix} coef1 & coef2 & coef3 \\ coef4 & coef5 & coef6 \\ coef7 & coef8 & coef9 \end{pmatrix} \begin{pmatrix} 1 & 0 & 0 \\ 0 & cost & sint \\ 0 & -sint & cost \end{pmatrix} \begin{pmatrix} Y \\ Cb \\ Cr \end{pmatrix}$$

$$= \begin{pmatrix} coef1 [coef2*cost-coef3*sint] [coef2*sint+coef3*cost] \\ coef4 [coef5*cost-coef6*sint] [coef5*sint+coef6*cost] \\ coef7 [coef8*cost-coef9*sint] [coef8*sint+coef9*cost] \end{pmatrix} \begin{pmatrix} Y \\ Cb \\ Cr \end{pmatrix}$$

7 3 x 3 CSC CSC 7 가

9 CSC (1) 3 가 1 (coef1 - coef9) (15)(16) (17) (18) 가 3 4 (15,16, 17,18) CSC (1) CSC (1) (sint)(cost) 8 MSB 256 (256\*coef1, 256\*coef4, 256 \*coef7) CSC 9 CSC

9 3 가 3 가 (1) 2 CSC(2) 가 4 가

가 .

CSC

가

가 .

CSC  
가 .

가

가

가

(57)

1.

(sine theta value) R.G.B (cosine theta value)

가 R,G,B

2.

1 ,

1 9 1 2 ;

1 1 3 ;

2 2 4 ;

1 3 1 ;

2 4 2 ;

1 2 가

3.

1 ,

1		1	,
2	1	2	,
3	2	3	,
4		4	,
5	1	5	,
6	2	6	,
7		7	,
8	1	8	,
9	2	9	,

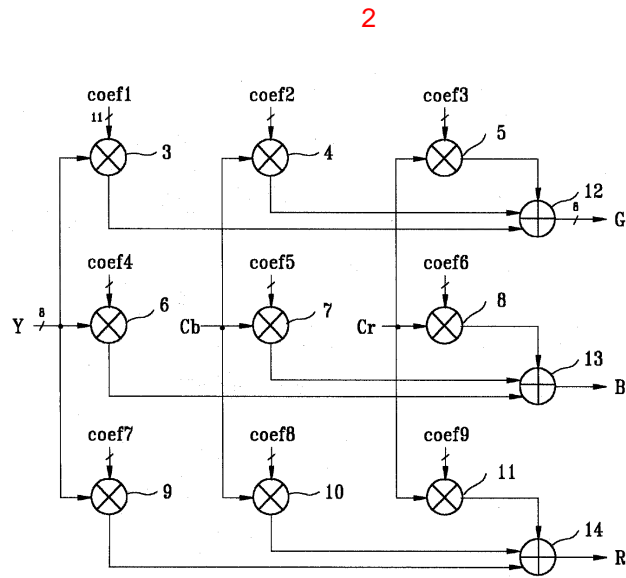
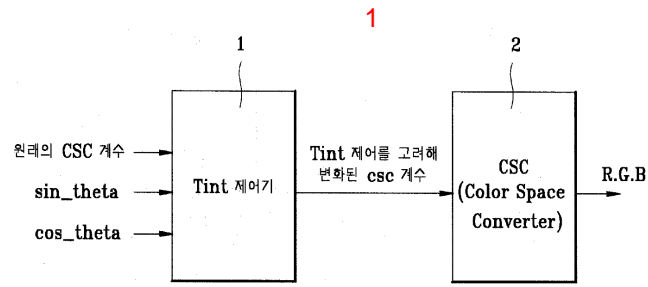
1 3 가 (G) 1 가 ,  
 4 6 가 (B) 2 가 ,  
 7 9 가 (R) 3 가

4.

1 x n ; 1 x n R.G.B. n x n  
 ; n x n n x n  
 n x n 1 x n 1 x n R.G.B.

5.

4 , n x n  
 $\begin{pmatrix} 1 & 0 & 0 \\ 0 & \cos\theta & \sin\theta \\ 0 & -\sin\theta & \cos\theta \end{pmatrix}$  ,  
 n x n  
 $\begin{pmatrix} \text{coef1} & [\text{coef2}*\cos t - \text{coef3}*\sin t] & [\text{coef2}*\sin t + \text{coef3}*\cos t] \\ \text{coef4} & [\text{coef5}*\cos t - \text{coef6}*\sin t] & [\text{coef5}*\sin t + \text{coef6}*\cos t] \\ \text{coef7} & [\text{coef8}*\cos t - \text{coef9}*\sin t] & [\text{coef8}*\sin t + \text{coef9}*\cos t] \end{pmatrix}$





3

