AN5344FBP

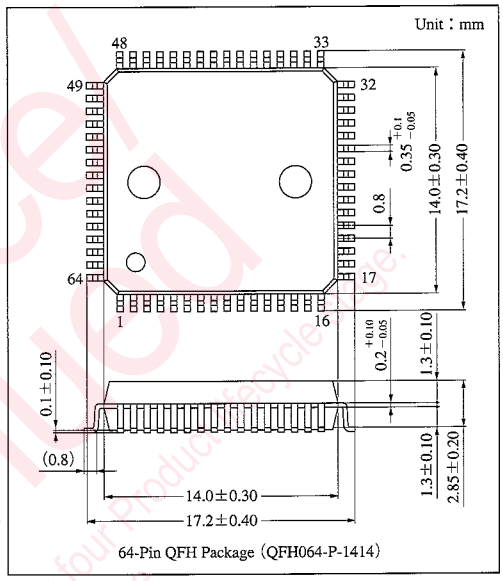
Color-Signal Correcting IC

■ Overview

The AN5344FBP is a chroma signal processor IC incorporated various video-quality improving techniques.

■ Features

- Flesh-tone correction : Automatic tint adjustment with respect to standard flesh tone
- CNR : Reduces color smear noise which occurs often in VCR and Laser Disk.
- CRI : Enhanced color details
- Flesh-tone brightness emhancement : Generating a brighter flesh tone
- Color limiter : Prevents red and blue saturation.



64-Pin QFH Package (QFH064-P-1414)

■ Absolute Maximum Ratings

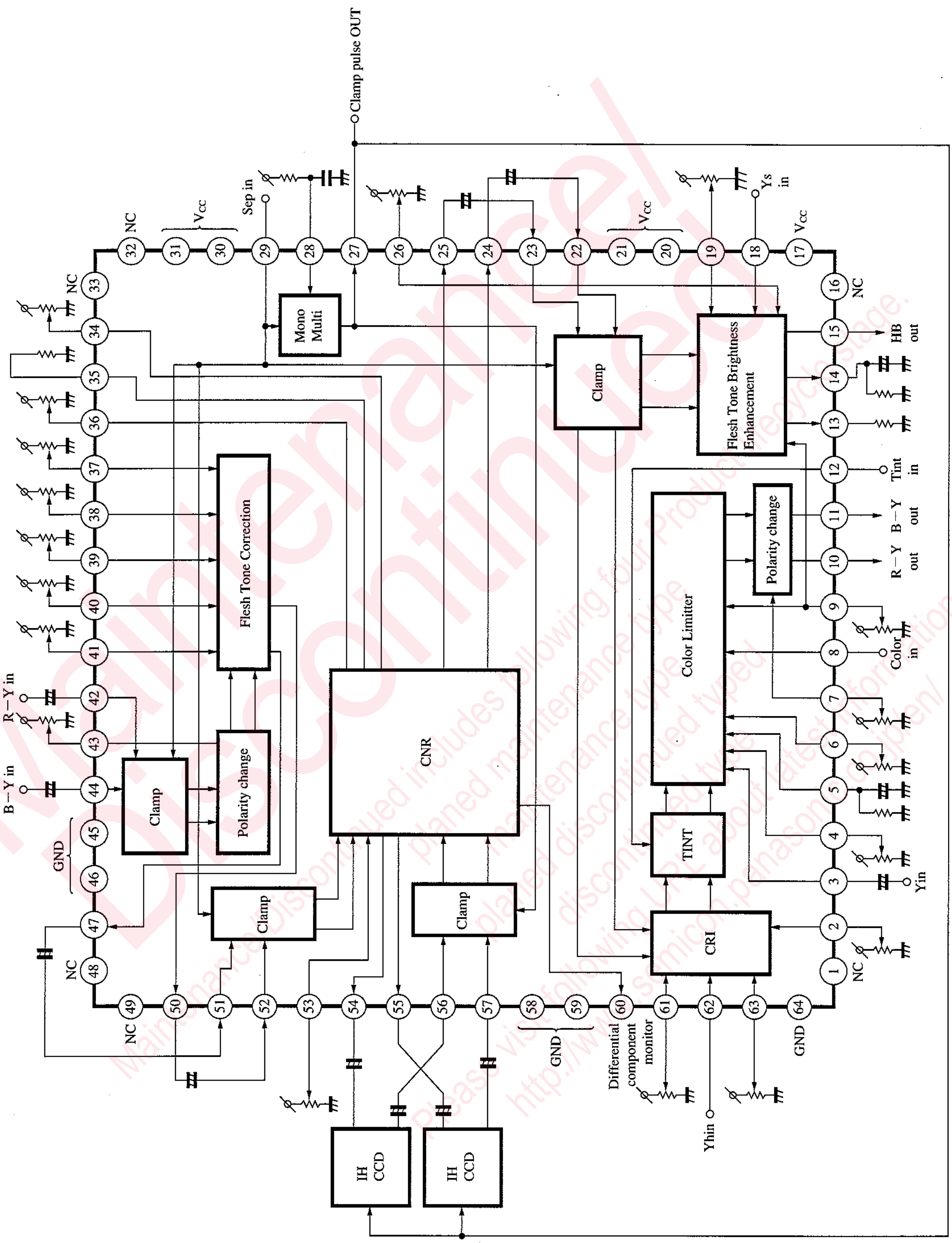
Parameter	Symbol	Rating	Unit
Supply voltage	V_{CC}	10.5	V
Supply current	I_{CC}	66.5	mA
Power dissipation Note 2)	P_D	1417	mW
Operating ambient temperature Note 1)	T_{opr}	−20 to +70	℃
Storage temperature Note 1)	T_{stg}	−55 to +150	℃

Note 1) Ta=25℃ except operating ambient temperature and storage temperature.
Note 2) Allowable power dissipation of the package at Ta=70℃ and mounted on the printbord.

■ Recommended Operating Range (Ta=25℃)

Parameter	Symbol	Range
Operating supply voltage range	V_{CC}	8.1V to 9.9V

■ Block Diagram



■ Electrical Characteristics (Ta=25±2℃)

Parameter	Symbol	Condition	min	typ	max	Unit
Supply current (1)	I_{20}		24.1	34.3	44.0	mA
Supply current (2)	I_{21}		8.40	12.0	16.5	mA
Supply current (3)	I_{30}		4.75	6.78	9.00	mA
Supply current (4)	I_{31}		4.68	6.69	9.00	mA
Supply current (5)	I_{17}		10.7	15.2	21.0	mA
Pin voltage	V_2		2.65	3.15	3.65	V
Pin voltage	V_4		3.79	4.29	4.79	V
Pin voltage	V_{12}		2.69	3.19	3.69	V
Pin voltage	V_{19}		2.10	2.60	3.10	V
Pin voltage	V_{26}		3.12	3.62	4.12	V
Pin voltage	V_{36}		2.85	3.35	3.85	V
Pin voltage	V_{37}		2.82	3.32	3.82	V
Pin voltage	V_{38}		3.13	3.63	4.13	V
Pin voltage	V_{39}		3.62	4.12	4.62	V
Pin voltage	V_{40}		2.61	3.11	3.61	V
Pin voltage	V_{41}		2.62	3.12	3.62	V
Pin voltage	V_{62}		2.32	2.82	3.32	V
Input impedance	Ri_4	DC measurement	16.0	20.0	24.0	kΩ
Flesh tone Correction Circuit						
Input amplitude gain control 1 (R−Y)	A_{C1R}	Gain at V_{43}=5V, input $1V_{P-P}$	3.92	4.90	5.88	times
Input amplitude gain control ratio 1	$R_{C1R/B}$	(R−Y), (B−Y) gain ratio at V_{43}=5V, input $1V_{P-P}$	0.88	1	1.12	times
Input amplitude gain control 2 (R−Y)	A_{C2R}	Gain at V_{43}=3.55V	1.55	2.08	2.39	times
Input amplitude gain control 2 (B−Y)	A_{C2B}	Gain at V_{43}=3.55V	1.62	2.17	2.49	times
Input amplitude gain control 3 (R−Y)	A_{C3R}	Gain at V_{43}=1V (Polarity inversion)	−5.88	−4.90	−3.92	times
Input amplitude gain control ratio 3	$R_{C3R/B}$	(R-Y), (B-Y) gain ratio at V_{43}=1V (Polarity inversion)	0.88	1	1.12	times
Input amplitude gain control 4 (R−Y)	A_{C4R}	Gain at V_{43}=2.7V (Polarity inversion)	−1.98	−1.72	−1.29	times
Input amplitude gain control 4 (B−Y)	A_{C4B}	Gain at V_{43}=2.7V (Polarity inversion)	−2.15	−1.87	−1.40	times
Flesh tone correction center axis	θ_{CC}	Center axis at V_{41}=3V	122	134	142	deg
Center axis variable width	$\Delta\theta_{CC}$	Center axis at V_{41}=1 to 5V	41.5	56.5	74.5	deg
Flesh tone correction stop level	V_{CSTOP}	Output level difference between 123° and 143° at V_{38}=3.8V	179	224	269	mV
Flesh tone correction gain control	ΔV_{CC1}	Output level difference between 123° and 143° at V_{37}=3V	−176	−141	−106	mV
Flesh tone correction quantity (R−Y)	ΔV_{CCR}	Output level difference between 123° and 143°	45	115	185	mV
Flesh tone correction quantity (B−Y)	ΔV_{CCB}	Output level difference between 123° and 143°	80	150	220	mV
Flesh tone correction clamp voltage (R−Y)	V_{47}		3.7	4.2	4.7	V
Flesh tone correction clamp voltage (B−Y)	V_{50}		3.7	4.2	4.7	V
Sandcastle pulse slice level 1	V_{SCP1}		3.01	3.51	4.01	V
Flesh tone Brightness Enhancement Circuit						
APL detection voltage	V_{APL}	Pin③ input, $0.714V_{O-P}$	1.47	1.87	2.27	V
APL detection voltage ratio	ΔV_{APL}	Pin③ input, ratio input $0.357V_{O-P}$ to input $0.714V_{O-P}$	0.14	0.34	0.54	times

■ Electrical Characteristics (cont.) (Ta=25±2℃)

Parameter	Symbol	Condition	min	typ	max	Unit
Y_S threshold voltage	V_{YSTH}	The lowest voltage at which Y_S is ON, when V_{18} is increased from 0V	1.55	2.05	2.25	V
Y_S characteristics	V_{YS}	When V_{18}=5V, V_{19}=4V	3.48	3.98	4.48	V
APL bias	V_{13}	43kΩ between Pin⑬ to GND	7.54	8.04	8.54	V
Flesh tone brightness Enhancement maximum output	$V_{HBmax.}$	When V_{26}=5V, V_{15} output level	0.49	0.68	0.76	V_{O-P}
Flesh tone brightness Enhancement correction ratio	ΔV_{HBCR}	When V_{26}=3V, ratio to V_{26}=5V	−10.67	−7.67	−4.67	dB
Flesh tone brightness Enhancement clamp voltage (R−Y)	V_{23}		3.68	4.18	4.68	V
Flesh tone brightness Enhancement clamp voltage (B−Y)	V_{22}		3.68	4.18	4.68	V
CRI Circuit						
CRI standard output (R−Y)	V_{DER}	Pin⑫ input, 30mV_{P-P}1MHz V_2=3V	0.43	0.61	0.86	V_{P-P}
CRI standard output (B−Y)	V_{DEB}	Pin⑫ input, 30mV_{P-P}1MHz V_2=3V	0.98	1.38	1.95	V_{P-P}
CRI maximum output (R−Y)	$\Delta V_{DERmax.}$	V_2=5V Ratio to standard output	2.73	4.31	5.89	dB
CRI maximum output (B−Y)	$\Delta V_{DEBmax.}$	V_2=5V Ratio to standard output	2.79	4.17	5.75	dB
CRI minimum output (R−Y)	$\Delta V_{DERmin.}$	V_2=1V Ratio to standard output	—	—	−18	dB
CRI minimum output (B−Y)	$\Delta V_{DEBmin.}$	V_2=1V Ratio to standard output	—	—	−18	dB
TINT Circuit						
Tint center	θ_{TC}	Calculate from the output when Pin㉒, ㉓ input is 3V_{P-P}, 10kHz and V_{12} open.	−8	0	8	deg
Tint control max.	$\Delta\theta_{Tmax.}$	Variation quantity from V_{12}=4V tint center	−54	−39	−24	deg
Tint control min.	$\Delta\theta_{Tmin.}$	Variation quantity from V_{12}=2V tint center	62	77	92	deg
Color Limiter Circuit						
Color peak detection 1 (R−Y)	V_{PIR}	Pin㉓ input 1.5V_{O-P} Pin⑤ output DC voltage	4.52	5.02	5.52	V
Color peak detection 1 (B−Y)	V_{PIB}	Pin㉒ input 1.5V_{O-P} Difference voltage from R−Y	−0.4	0	0.4	V
Color peak detection 2 (R−Y)	V_{P2R}	Pin㉓ input 0.5V_{O-P} Difference voltage from color peak detection 1 (R−Y)	−2.29	−1.89	−1.49	V
Color peak detection 2 (B−Y)	V_{P2B}	Pin㉒ input 0.5V_{O-P} Difference voltage from color peak detection 2 (R−Y)	−0.4	0	0.4	V
Color limit level 1	V_{L1}	Pin㉒ input 2V_{O-P} V_{11} where Pin⑥ to GND is 22kΩ	1.75	2.19	2.63	V_{O-P}
Color limit level 2	V_{L2}	Ratio to color limit level 1, when Pin⑥ to GND is 82kΩ	0.55	0.76	0.92	times
Output amplitude gain control 1 (R−Y)	A_{L1R}	Pin㉒, ㉓ input 3V_{P-P} at V_7=5V	0.81	1.08	1.24	times
Output amplitude gain control ratio 1	$R_{L1R/B}$	Pin㉒, ㉓ input 3V_{P-P} (R−Y), (B−Y) gain ratio at V_7=5V	0.88	1.0	1.12	times
Output amplitude gain control 2 (R−Y)	A_{L2R}	At V_7=3.5V	0.28	0.36	0.43	times
Output amplitude gain control 2 (B−Y)	A_{L2B}	At V_7=3.5V	0.28	0.36	0.43	times
Output amplitude gain control 3 (R−Y)	A_{L3R}	At V_7=1V (Polarity inversion)	−1.20	−1.04	−0.78	times
Output amplitude gain control ratio 3	$R_{L3R/B}$	At V_7=1V (Polarity inversion) (R−Y), (B−Y) gain ratio	0.88	1.0	1.12	times
Output amplitude gain control 4 (R−Y)	A_{L2B}	At V_7=2.5V (Polarity inversion)	−0.84	−0.73	−0.55	times

■ Electrical Characteristics (cont.) (Ta = 25 ± 2℃)

Parameter	Symbol	Condition	min	typ	max	Unit
Output amplitude gain control 4 (B − Y)	A_{L4B}	When V_7 = 2.5V (Polarity inversion)	−0.86	−0.75	−0.56	times
Color limit level 3	V_{L3}	Pin③ input 0.714V_{O-P} Ratio to limit level 1 when Pin⑥ to GND is 82kΩ	0.95	1.00	1.05	times
Color control 1 (R − Y)	A_{LC1R}	Pin㉒, ㉓ input 3V_{P-P} Output level at V_8 = 3V	0.35	0.44	0.53	times
Color control 1 (B − Y)	A_{LC1B}	Pin㉒, ㉓ input 3V_{P-P} Output level at V_8 = 3V	0.35	0.44	0.53	times
Color control 2 (R − Y)	A_{LC2R}	At V_8 = 1V, Ratio to V_8 = 3V	—	—	−40	dB
Color control 2 (B − Y)	A_{LC2B}	At V_8 = 1V, Ratio to V_8 = 3V	—	—	−40	dB
Pedestal clamp voltage	V_3		3.06	3.56	4.06	V
CNR Circuit						
CNR gain 1 (R − Y)	A_{N1R}	V_{53} = 0V, input 3V_{P-P}, Pin51 input, Pin㉕ output	−1.5	0	1.5	dB
CNR gain ratio 1	$R_{N1R/B}$	R − Y/B − Y when V_{53} = 0V, input 3V_{P-P}	0.88	1	1.12	times
Difference adjustment gain (R − Y)	A_{dR}	V_{36} = 3V, input 60mV_{P-P}, Pin56 input, Pin54 output	−5.74	−3.46	−1.18	dB
Difference adjustment gain ratio	$R_{dR/B}$	V_{36} = 3V, input 60mV_{P-P}, Pin57 input, Pin55 output	0.74	0.95	1.10	times
Difference adjustment maximum gain (R − Y)	$A_{dRmax.}$	V_{36} = 5V, input 60mV_{P-P}, Pin56 input, Pin54 output	1.5	3.8	6.1	dB
Difference adjustment maximum gain (B − Y)	$A_{dBmax.}$	V_{36} = 5V, input 60mV_{P-P}, Pin57 input, Pin55 output	2.3	4.6	6.9	dB
K operation offset (R − Y)	V_{K1R}	V_{35} = 9V, input 60mV_{P-P}, Pin56 input, Pin54 output	—	—	−12	dB
K operation offset (B − Y)	V_{K1B}	V_{35} = 9V, input 60mV_{P-P}, Pin57 input, Pin55 output	—	—	−12	dB
CNR gain 2 (R − Y)	A_{N2R}	V_{53} = 0V, input 3V_{P-P}, Pin51 input, Pin54 output	−11.29	−8.29	−5.29	dB
CNR gain ratio 2	$R_{N2R/B}$	R − Y, B − Y ratio when V_{53} = 0V, input 3V_{P-P}	0.88	1	1.12	times
K operation gain 1 (R − Y)	A_{K1R}	V_{34} = 9V, input 60mV_{P-P}, Pin56 input, Pin54 output	—	—	−15	dB
K operation gain 1 (B − Y)	A_{K1B}	V_{34} = 9V, input 60mV_{P-P}, Pin57 input, Pin55 output	—	—	−15	dB
K operation gain 2 (R − Y)	A_{K2R}	V_{34} = 3V, input 60mV_{P-P}, Pin56 input, Pin54 output	−5.5	−3.2	−0.9	dB
K operation gain 2 (B − Y)	A_{K2B}	V_{35} = 3V, input 60mV_{P-P}, Pin57 input, Pin55 output	−5.3	−2.6	0	dB
Sandcastle pulse slice level 2	V_{scp2}		1.8	2.3	2.8	V
Difference monitor amplitude	V_{MR}	Input 3V_{P-P} Pin51 input, Pin60 output	0.336	0.480	0.624	V_{P-P}
K control 1 (R − Y)	A_{NC1R}	V_{53} = 0V, input 60mV_{P-P}, Pin56 input, Pin㉕ output	—	—	−30	dB
K control 1 (B − Y)	A_{NC1B}	V_{53} = 0V, input 60mV_{P-P}, Pin57 input, Pin㉔ output	—	—	−30	dB
K control 2 (R − Y)	A_{NC2R}	V_{53} = 2V, input 60mV_{P-P}, Pin56 input, Pin㉕ output	−6.1	−3.8	−1.5	dB
K control 2 (B − Y)	A_{NC2B}	V_{53} = 2V, input 60mV_{P-P}, Pin57 input, Pin㉔ output	−5.3	−3.0	−0.7	dB
K control 3 (R − Y)	A_{NC3R}	V_{53} = 6V, input 60mV_{P-P}, Pin56 input, Pin㉕ output	0.12	2.42	4.72	dB
K control 3 (B − Y)	A_{NC3B}	V_{53} = 6V, input 60mV_{P-P}, Pin57 input, Pin㉔ output	1.08	3.38	5.68	dB

■ Electrical Characteristics (cont.) (Ta=25±2℃)

Parameter	Symbol	Condition	min	typ	max	Unit
K control 4 (R−Y)	A_{NC4R}	V_{53}=0V, input 60mV_{P-P}, Pin(56) input, Pin(54) output	—	—	−30	dB
K control 4 (B−Y)	A_{NC4B}	V_{53}=0V, input 60mV_{P-P}, Pin(57) input, Pin(55) output	—	—	−30	dB
K control 5 (R−Y)	A_{NC5R}	V_{53}=2V, input 60mV_{P-P}, Pin(56) input, Pin(54) output	—	—	−30	dB
K control 5 (B−Y)	A_{NC5B}	V_{53}=2V, input 60mV_{P-P}, Pin(57) input, Pin(55) output	—	—	−30	dB
CNR clamp voltage (R−Y)	V_{51}		3.60	4.10	4.60	V
CNR clamp voltage (B−Y)	V_{52}		3.60	4.10	4.60	V
CCD clamp voltage (R−Y)	V_{56}		6.34	6.84	7.34	V
CCD clamp voltage (B−Y)	V_{57}		6.30	6.80	7.30	V
CNR switch threshold voltage	V_{CNRTH}	The lowest voltage at which CNR is ON, when V_{53} is increased from 0V	0.2	0.6	1.0	V

■ Electrical Characteristics [Reference Value] (Ta=25±2℃)

Parameter	Symbol	Condition	min	typ	max	Unit
Flesh tone Correction Circuit						
+side control range	θ_{C+}	Phase at V_{40}=3V	114	148	172	deg
+side control variable width	$\Delta\theta_{C+}$	Control range variation quantity at V_{40}=2 to 5V	36	47	58	deg
−side control range	θ_{C-}	Phase at V_{39}=3V	80	91	102	deg
−side control variable width	$\Delta\theta_{C-}$	Control range variation quantity at V_{39}=2 to 5V	0	9	24	deg
Flesh tone correction quantity (R−Y) ambient temperature dependency	$\frac{\Delta V_{CCR}}{\Delta T}$	Color correction quantity (R−Y) variation rate, at Ta=−20 to +70℃ change	—	1.0	—	mV/℃
Flesh tone correction quantity (B−Y) ambient temperature dependency	$\frac{\Delta V_{CCB}}{\Delta T}$	Color correction quantity (B−Y) variation rate, at Ta=−20 to +70℃ change	—	2.0	—	mV/℃
Flesh tone correction quantity (R−Y) supply voltage dependency	$\frac{\Delta V_{CCR}}{\Delta V}$	Color correction quantity (R−Y) variation rate, at T_{CC}=9V −10% to +10% change	—	10	—	mV/V
Flesh tone correction quantity (B−Y) supply voltage dependency	$\frac{\Delta V_{CCB}}{\Delta V}$	Color correction quantity (B−Y) variation rate, at T_{CC}=9V −10% to +10% change	—	−3.0	—	mV/V
Flesh tone Brightness Enhancement Circuit						
Flesh tone brightness enhancement maximum output ambient temperature dependency	$\frac{\Delta V_{HBmax.}}{\Delta T}$	Flesh-color brightness maximum output variation rate at Ta=−20 to +70℃ change	—	−0.10	—	$\frac{mV_{O-P}}{℃}$
Flesh tone brightness enhancement maximum output supply voltage dependency	$\frac{\Delta V_{HBmax.}}{\Delta V}$	Flesh color bright maximum output variation rate at V_{CC}=9V−10% to +10% change	—	90	—	$\frac{mV_{O-P}}{V}$
CRI Circuit						
Coring quantity 1	V_{CORE1}	Between Pin(61) to GND, 510kΩ. Ratio to CRI standard output (B−Y)	0.50	0.81	1	times
Coring quantity 2	V_{CORE2}	Between Pin(61) to GND, 200kΩ. Ratio to CRI standard output (B−Y)	0.34	0.55	0.85	times
Slice level 1 (R−Y)	V_{S1R}	Between Pin(63) to GND, 150kΩ. Ratio to CRI standard output (R−Y)	0.40	0.62	0.95	times
Slice level 1 (B−Y)	V_{S1B}	Between Pin(63) to GND, 150kΩ. Ratio to CRI standard output (B−Y)	0.41	0.63	0.96	times
Slice level 2 (R−Y)	V_{S2R}	Between Pin(63) to GND, 100kΩ. Ratio to CRI standard output (R−Y)	0.12	0.26	0.45	times
Slice level 2 (B−Y)	V_{S2B}	Between Pin(63) to GND, 100kΩ. Ratio to CRI standard output (B−Y)	0.12	0.26	0.45	times

Note) The characteristics value in parentheses is not a guaranteed value, but reference one on design.

■ Electrical Characteristics [Reference Value] (cont.) (Ta=25±2℃)

Parameter	Symbol	Condition	min	typ	max	Unit
CRI standard output (R−Y) ambient temperature dependency	$\frac{\Delta V_{DER}}{\Delta T}$	CRI standard output (R−Y) variation factor, at Ta=−20 to +70℃ change	—	−0.5	—	$\frac{mV_{P-P}}{℃}$
CRI standard output (B−Y) ambient temperature dependency	$\frac{\Delta V_{DEB}}{\Delta T}$	CRI standard output (B−Y) variation factor, at Ta=−20 to +70℃ change	—	−3.0	—	$\frac{mV_{P-P}}{℃}$
CRI standard output (R−Y) supply voltage dependency	$\frac{\Delta V_{DER}}{\Delta V}$	CRI standard output (R−Y) variation factor, at V_{CC}=9V −10% to +10% change	—	25	—	$\frac{mV_{P-P}}{V}$
CRI standard output (B−Y) supply voltage dependency	$\frac{\Delta V_{DEB}}{\Delta V}$	CRI standard output (B−Y) variation factor, at V_{CC}=9V −10% to +10% change	—	60	—	$\frac{mV_{P-P}}{V}$
TINT Circuit						
TINT center ambient temperature dependency	$\frac{\Delta \theta_{CC}}{\Delta T}$	At Ta=−20 to +70℃ change	—	0	—	deg/℃
TINT center supply voltage dependency	$\frac{\Delta \theta_{CC}}{\Delta V}$	At V_{CC}=9V−10% to +10% change	—	−0.5	—	deg/V
Color Limiter Circuit						
Color limit level (R−Y) ambient temperature dependency	$\frac{V_{1,2R}}{\Delta T}$	Color limit level (R−Y) variation factor, at Ta=−20 to +70℃ change	—	0.5	—	$\frac{mV_{P-P}}{℃}$
Color limit level (B−Y) ambient temperature dependency	$\frac{V_{1,2B}}{\Delta T}$	Color limit level (B−Y) variation factor, at Ta=−20 to +70℃ change	—	0.5	—	$\frac{mV_{P-P}}{℃}$
Color limit level (R−Y) supply voltage dependency	$\frac{V_{1,2R}}{\Delta V}$	Color limit level (R−Y) variation factor, at V_{CC}=−10% to +10% change	—	100	—	$\frac{mV_{P-P}}{V}$
Color limit level (B−Y) supply voltage dependency	$\frac{V_{1,2B}}{\Delta V}$	Color limit level (B−Y) variation factor, at V_{CC}=−10% to +10% change	—	100	—	$\frac{mV_{P-P}}{V}$
CNR Circuit						
Group delay time (R−Y)	G_{DR}	K operation delay time (R−Y) in CNRON	40.8	68.0	95.0	ns
Group delay time (B−Y)	G_{DB}	K operation delay time (B−Y) in CNRON	39.8	66.4	93.0	ns
DG_N (R−Y)	DG_{NR}	DG of Pin㊶ → Pin㊹	−1	0	1	%
DG_N (B−Y)	DG_{NB}	DG of Pin㊷ → Pin㊺	−1	0	1	%
Clamp pulse width	T_{CLP}	Pulse width of Pin㉗	0.65	0.93	1.21	μs
K control 2 (R−Y) ambient temperature dependency	$\frac{\Delta A_{NC2R}}{\Delta T}$	K control 2 (R−Y) variation factor, at Ta=−20 to +70℃ change	—	−0.015	—	dB/℃
K control 2 (B−Y) ambient temperature dependency	$\frac{\Delta A_{NC2B}}{\Delta T}$	K control 2 (B−Y) variation factor, at Ta=−20 to +70℃ change	—	−0.015	—	dB/℃
K control 2 (R−Y) supply voltage dependency	$\frac{\Delta A_{NC2R}}{\Delta V}$	K control 2 (R−Y) variation factor, at V_{CC}=9V −10% to +10% change	—	0.35	—	dB/V
K control 2 (B−Y) supply voltage dependency	$\frac{\Delta A_{NC2B}}{\Delta V}$	K control 2 (B−Y) variation factor, at V_{CC}=9V −10% to +10% change	—	0.35	—	dB/V

Note) The characteristics value in parentheses is not a guaranteed value, but reference one on design.

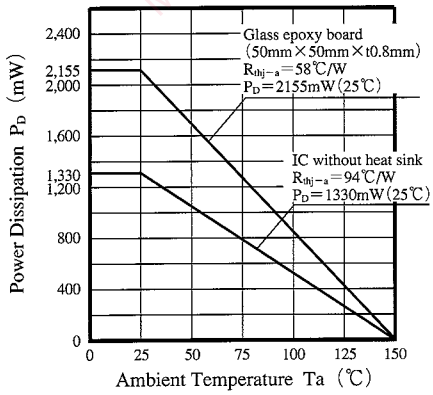
Pin Descriptions

Pin No.	Pin name	Pin No.	Pin name
1	NC	33	NC
2	CRI correction amount	34	K operation gain control
3	Y input	35	Offset control
4	Limit slice level	36	Difference control
5	Color peak detection	37	Flesh tone correction gain control
6	Color limit level	38	Flesh tone correction stop control
7	Output polarity gain control	39	−side compensation control
8	Color control voltage	40	+side compensation control
9	APL inter lock limiter switch	41	Central axis control
10	R−Y output	42	R−Y input
11	B−Y output	43	Input polarity gain control
12	Tint control voltage	44	B−Y input
13	APL shift adj.	45	GND3 (B−Y system)
14	APL detection	46	GND4 (R−Y system)
15	Flesh tone brightness enhancement output	47	Flesh tone correction R−Y output
16	NC	48	NC
17	V_{CC5} (for CNR)	49	NC
18	YS input	50	Flesh tone correction B−Y output
19	External DC input	51	CNR R−Y input
20	V_{CC1} (Main)	52	CNR B−Y input
21	V_{CC2} (clamp system)	53	K control
22	Flesh tone brightness enhancement B−Y input	54	CCD R−Y input
23	Flesh tone brightness enhancement R−Y input	55	CCD B−Y input
24	CNR B−Y output	56	CCD R−Y output
25	CNR R−Y output	57	CCD B−Y output
26	Flesh tone brightness correction amount	58	GND1 (main)
27	Clamp pulse output	59	GND2 (clamp system)
28	Mono-multi CR	60	Difference monitor
29	SCP input	61	CRI coring level
30	V_{CC3} (B−Y system)	62	Y-high pass input
31	V_{CC4} (R−Y system)	63	CRI slice level
32	NC	64	GND5 (for CNR)

Reference

Power Dissipation of Package

P_D − Ta



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(5) When designing your equipment, comply with the range of absolute maximum rating and the guaranteed operating conditions (operating power supply voltage and operating environment etc.). Especially, please be careful not to exceed the range of absolute maximum rating on the transient state, such as power-on, power-off and mode-switching. Otherwise, we will not be liable for any defect which may arise later in your equipment.
 Even when the products are used within the guaranteed values, take into the consideration of incidence of break down and failure mode, possible to occur to semiconductor products. Measures on the systems such as redundant design, arresting the spread of fire or preventing glitch are recommended in order to prevent physical injury, fire, social damages, for example, by using the products.

(6) Comply with the instructions for use in order to prevent breakdown and characteristics change due to external factors (ESD, EOS, thermal stress and mechanical stress) at the time of handling, mounting or at customer's process. When using products for which damp-proof packing is required, satisfy the conditions, such as shelf life and the elapsed time since first opening the packages.

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