

M52038ASP

PAL SYSTEM SINGLE-CHIP COLOR TV SIGNAL PROCESSOR

DESCRIPTION

The M52038ASP is a single chip semiconductor integrated circuit that has color TV signal-processing functions. It processes signals of video intermediate frequency, audio intermediate frequency as well as video, color, and deflection signals. Combining it with a tuner and simple output drive circuits, based on discrete transistors, enables low-cost design of PAL color TV sets.

FEATURES

- Provided with all signal-processing functions except tuner and output drive functions. Useful in TV set cost-reduction.
- Input pins are used for differential inputs, using two input pins for each signal. They improve stability and prevent oscillations.
- For horizontal oscillation, the oscillator uses a ceramic resonator to produce reference signal of 32 times the horizontal deflection frequency. The count-down of the reference signal provides horizontal deflection signal. It is unnecessary, therefore, to adjust free-running frequency.
- For vertical oscillation, the count-down of twice the horizontal deflection signal, produced by the horizontal deflection count-down circuit, provides the vertical deflection signal. It eliminates the variable resistor for vertical synchronization. The count-down method has reduced the number of additional parts in the vertical deflection circuit.
- Capable of the AFT defeat, video muting, and audio muting functions.
- Picture quality, contrast, brightness, color saturation, and sound volume are each controlled by direct currents.
- Combining this IC with the SECAM chroma-IC enables a dual system composition.

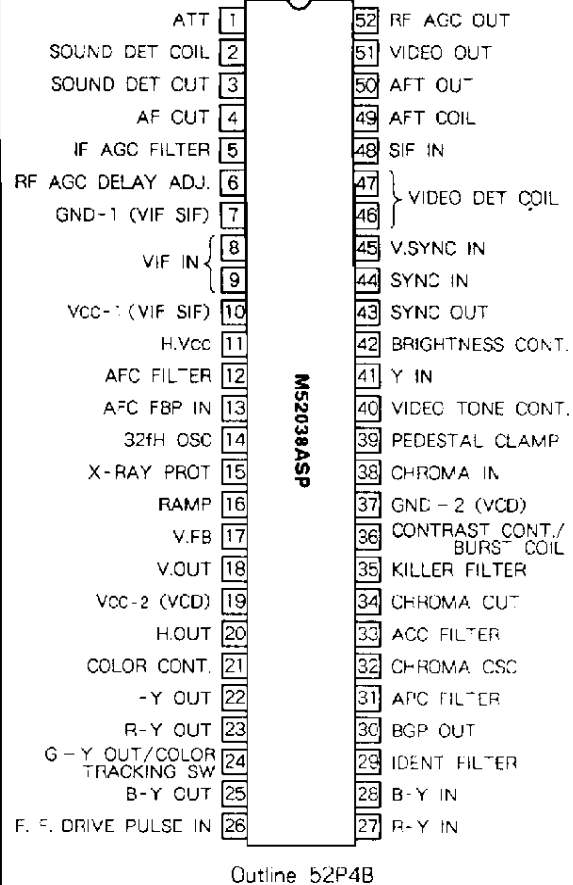
APPLICATION

PAL color TV sets.

RECOMMENDED OPERATING CONDITION

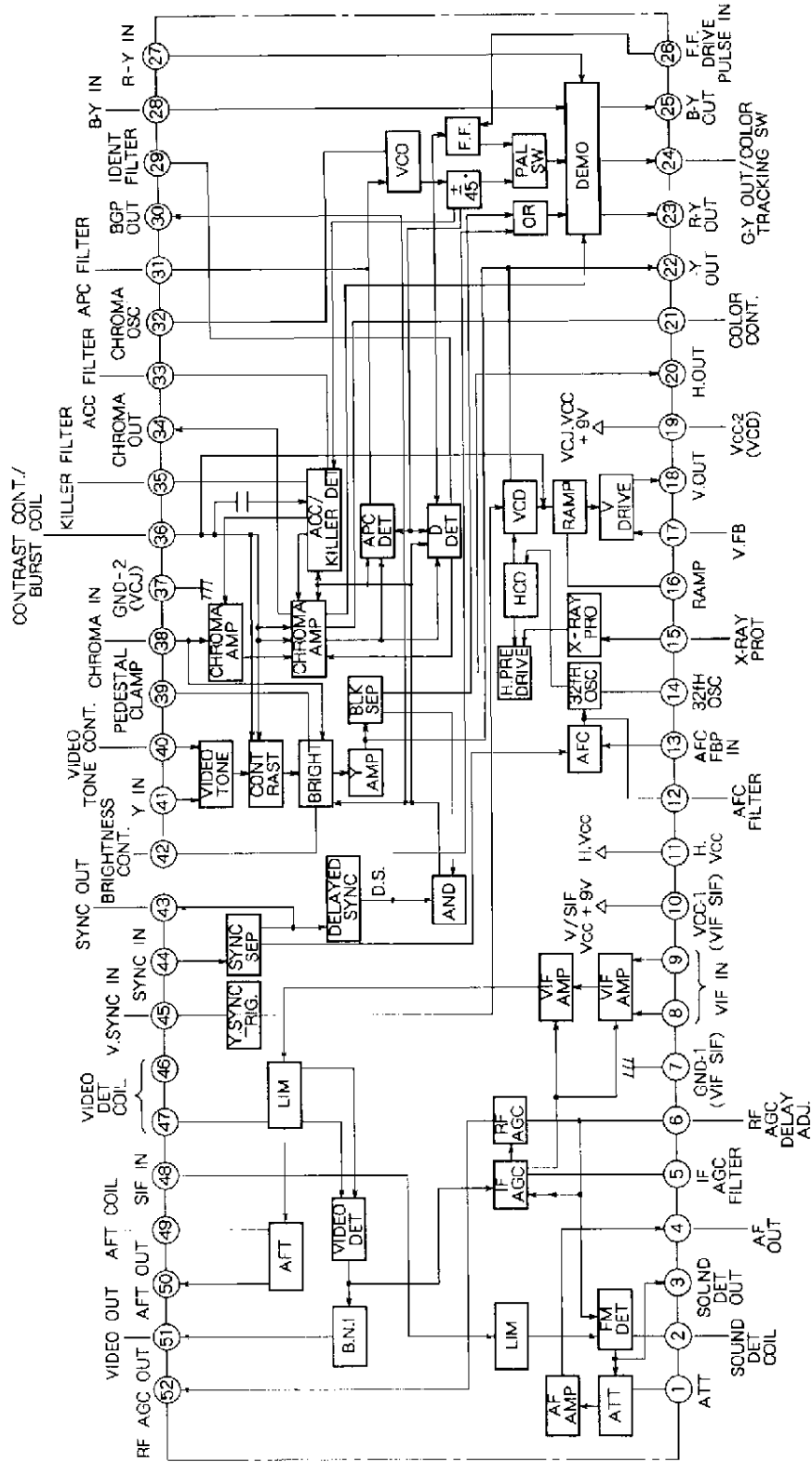
Supply voltage range.....8.5~9.5V(V₁₀, V₁₉)
 Rated supply voltage.....9.0V(V₁₀, V₁₉)
 Supply current range.....15~22mA(I₁₁)
 Rated supply current.....18mA(I₁₁)

PIN CONFIGURATION (TOP VIEW)



PAL SYSTEM SINGLE-CHIP COLOR TV SIGNAL PROCESSOR

BLOCK DIAGRAM



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PAL SYSTEM SINGLE-CHIP COLOR TV SIGNAL PROCESSOR

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Ratings	Unit
V _{cc}	Supply voltage	10.8	V
P _d	Power dissipation	1.4	W
T _{opr}	Operating temperature	-20~65	°C
T _{stg}	Storage temperature	-40~125	°C

ELECTRICAL CHARACTERISTICS (T_a = 25 °C, unless otherwise noted)

VIF-SIF SECTION

Symbol	Parameter	Test Point	Input ()	Test conditions *														Limits			Unit						
				1	5	6	V _{cc} 10	S 2	S 5	S 6	S 6A	S 10	S 10A	S 47	S 48	S 48A	S 49	S 51	S 52	S 52A		Min.	Typ.	Max.			
I _{cc10}	Circuit current	A10	-	-	-	-	9.0V	-	-	○	-	-	○	-	-	-	-	-	-	-	-	-	-	27	36	50	mA
V ₅₁	Video output DC voltage	51	-	-	-	-	9.0V	○	○	○	-	○	-	-	-	-	○	-	○	-	-	-	-	4.55	4.9	5.35	V
V ₀₅₁	Video output signal voltage	51	A SG1	-	-	-	9.0V	○	-	○	-	○	-	-	-	-	○	-	○	-	-	-	-	1.7	2.0	2.3	V _{p-p}
V _{51L}	Sync. tip voltage	51	A SG2	-	-	-	9.0V	○	-	○	-	○	-	-	-	-	○	-	○	-	-	-	-	2.3	2.6	2.9	V
V _{in min}	Input sensitivity	51A	A SG3	-	-	-	9.0V	○	-	○	-	○	-	-	-	-	○	-	○	-	-	-	-	37	45	51	dBμ
V _{in max}	Maximum allowable input	51A	A SG4	-	-	-	9.0V	○	-	○	-	○	-	-	-	-	○	-	○	-	-	-	-	103	110		dBμ
V _{BTH}	Black spot noise inverter	51	A SG2 SG5	-	-	-	9.0V	○	-	○	-	○	-	-	-	-	○	-	○	-	-	-	1.7	2.0	2.3	V	
V _{BCL}																							3.3	3.8	4.3	V	
BW	Video frequency characteristics	51	A SG8	-	-	-	9.0V	○	-	○	-	○	-	-	-	-	○	-	○	-	-	-	-	5.6	8		MHz
IM	Inter-modulation	51	A SG9	-	-	-	9.0V	○	-	○	-	○	-	-	-	-	○	-	○	-	-	-	-	32	45		dB
S/N	Video noise	51A	A SG2	-	-	-	9.0V	○	-	○	-	○	-	-	-	-	○	-	○	-	-	-	-	50	56		dB
V ₅₀	AFT output DC voltage	50	-	-	-	-	9.0V	○	○	○	-	○	-	-	-	-	-	-	-	-	-	-	-	3.0	4.0	5.0	V
V _{50H}	AFT output maximum voltage	50	A SG6	-	-	-	9.0V	○	-	○	-	○	-	-	-	-	-	-	-	-	-	-	-	8.0	8.7		V
V _{50L}	AFT output minimum voltage	50	A SG7	-	-	-	9.0V	○	-	○	-	○	-	-	-	-	-	-	-	-	-	-	-		0.3	1.0	V
μ AFT	AFT sensitivity	50	A SG5	-	-	-	9.0V	○	-	○	-	○	-	-	-	-	-	-	-	-	-	-	-	40	60	120	mV/kHz
V _{50D}	AFT defeat voltage	50	A SG5	-	-	-	9.0V	○	-	○	-	○	-	-	-	-	-	-	-	-	-	-	-	4.35	4.5	4.65	V
V _{52H}	RF AGC maximum voltage	52	A SG11	-	-	-	2.5V 9.0V	○	-	○	-	○	-	-	-	-	○	-	○	-	-	-	-	7.0	8.0		V
V _{52L}	RF AGC minimum voltage	52	A SG10	-	-	-	2.5V 9.0V	○	-	○	-	○	-	-	-	-	○	-	○	-	-	-	-		0.01	0.3	V
V. S. MUTE1	Sync mute starting voltage	5	5	-	9.0V	M	9.0V	-	-	-	-	○	-	-	-	-	○	-	○	-	-	-	-		0.7	1.2	V
V ₃	AF direct output direct current voltage	3	-	-	-	-	9.0V	○	○	○	-	○	-	-	-	-	○	-	○	-	-	-	-	3.4	3.9	4.5	V
V _{0AF}	AF direct output signal voltage	3	C SG12	-	-	-	9.0V	-	○	○	-	○	-	-	-	-	○	-	○	-	-	-	-	540	630	720	mVrms

* : "-" Indicates open.

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VIF-SIF SECTION (cont.)

Symbol	Parameter	Test Point	Input ()	Test conditions*																Limits			Unit		
				1	5	6	Vcc 10	S 2	S 5	S 6	S 6A	S 10	S 10A	S 47	S 48	S 48A	S 49	S 51	S 52	S 52A	Min.	Typ.		Max.	
LIM	Limiting sensitivity	3	C SG14	-	-	-	9.0V	-	○	○	-	○	-	-	-	○	○	-	○	-	-		42	50	dBμ
AMR	AMR	3	C SG15	-	-	-	9.0V	-	○	○	-	○	-	-	-	○	○	-	○	-	-	50	60		dB
Vc4	AF driver output	4	C SG12	-	-	-	9.0V	-	○	○	-	○	-	-	-	○	○	-	○	-	-	250	460	650	mVrms
V04 max	AF driver maximum output	4	C SG12	9.0V	-	-	9.0V	-	○	○	-	○	-	-	-	○	○	-	○	-	-	700	930	1200	mVrms
ATT	Maximum attenuation	4	C SG12	9.0V	-	-	9.0V	-	○	○	-	○	-	-	-	○	○	-	○	-	-	70	80		dB
GAf	AF driver gain																				2.1	4.3	5.2	dB	
S/N AF	Sound S/N	4	C SG16	9.0V	-	-	9.0V	-	○	○	-	○	-	-	-	○	○	-	○	-	-	55	66		dB
S MUTE	Sound mute voltage	2	C SG12	9.0V	-	-	9.0V	○	○	○	-	○	-	-	-	○	○	-	○	-	-		0.4	1.0	mVrms
V.S. MUTE2	Video sound muting sound output	4	C SG12	9.0V	-	Variable	9.0V	-	-	-	○	-	-	-	○	○	-	○	-	-		0.3	1.0	V	
THD AF	AF driver maximum output distortion	4	C SG12	9.0V	-	-	9.0V	○	○	○	-	○	-	-	-	○	○	-	○	-	-		1	5	%
V1	Pin ① voltage	1	-	H	-	-	9.0V	-	○	○	-	○	-	-	-	○	○	-	○	-	-	4.8	5.3	5.8	V

* : "-" Indicates open.

SYNC. SECTION (Horizontal)

Symbol	Parameter	Test Point	Input ()	Test conditions*																Limits			Unit		
				11	11A	15	16A	17	19	S 11	S 11A	S 11B	S 12	S 12A	S 13	S 16	S 17	S 19	S 20	S 22	S 36	S 44		S 44A	Min.
I _{SS}	Sync. separation input sensitivity current	I _{SS} 43	I _{SS} variable	-	-	-	9.0V	-	-	-	-	-	-	-	-	○	-	-	-	-	○	0.05	0.1	0.2	mA
V _{43H}	Sync. separation output maximum voltage	43	D SG17	-	-	-	9.0V	-	-	-	-	-	-	-	-	○	-	-	-	-	○	8.0	8.9		V _{O-P}
V _{43L}	Sync. separation output minimum voltage	43	D SG17	-	-	-	9.0V	-	-	-	-	-	-	-	-	○	-	-	-	-	○	2.5	3.0	3.5	V _{O-P}
T _{BGP-I}	B.G.P timing	D 30	D SG18	-	-	-	9.0V	-	-	-	-	-	-	-	-	○	-	-	-	-	○	0	1	2	μs
T _{BGP-II}																						2.0	3.0	4.5	μs
V _{BGP-H}	B.G.P amplitude	30	D SG18	-	-	-	9.0V	-	-	-	-	-	-	-	-	○	-	-	-	-	○	5.4	6.2	7.0	V _{O-P}
V _{BGP-L}																							0	0.3	V _{O-P}
I _{CC 11}	H.Vcc inflow current	A11	-	12.0V	-	-	-	-	-	○	○	-	-	-	-	-	-	-	-	-	-	12.0	16.0	20.0	mA
f _H	Horizontal freerun frequency	20	-	12.0V	-	-	-	-	-	○	-	○	-	-	-	-	-	-	-	-	-	15.20	15.625	15.95	kHz
V _{11 min}	Horizontal oscillator starting voltage	11 20	-	Variable	0V	-	-	-	○	-	○	-	-	-	-	-	-	-	-	-	-		4.5	5.4	V
f _{PHI}	Horizontal pull-in range	D20	D SG18 f variable	9.0V	9.0V	0V	-	-	9.0V	○	-	○	○	-	-	○	-	-	-	-	○	-500	-600		Hz
f _{PHL}																						+500	+600		Hz
V _{20H}	Horizontal output maximum voltage	20	D SG18	9.0V	9.0V	0V	-	-	9.0V	○	-	○	○	-	-	○	-	-	-	-	○	3.2	3.8		V _{O-P}

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SYNC. SECTION (Horizontal) (cont.)

Symbol	Parameter	Test Point	Input ()	Test conditions*																	Limits			Unit						
				11A	15A	16A	17	19	S11A	S11B	S12A	S12B	S13A	S16	S17	S19	S20	S22	S36	S44A	S44B	Min.	Typ.		Max.					
V _{20L}	Horizontal output minimum voltage	20	D SG18	9.0	9.0	0	-	9.0	0	-	0	0	0	-	0	0	-	0	0	-	0	0	0	0	0	0		0	0.3	V _{O-P}
T _H	Horizontal output pulse width	20	D SG18	9.0	9.0	0	-	9.0	0	-	0	0	0	-	0	0	-	0	0	-	0	0	0	0	0	0	22	24	26	μs
V _{20H} (6V)	Pin (1) = when 6V horizontal output maximum voltage	20	-	6.0	0	-	-	0	-	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.2	1.8	2.4	V _{O-P}	
f _H (V _{CC})	Free-run frequency increase/decrease supply voltage	20	-	9V 15V	0	-	-	-	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15.20	15.625	15.95	kHz	
V _{PRO}	Overvoltage detection operating voltage	15 20	-	9.0	-	-	-	-	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.63	0.73	0.83	V	

* : "-" Indicates open.

SYNC. SECTION (Vertical)

Symbol	Parameter	Test Point	Input ()	Test conditions*																	Limits			Unit							
				11A	15A	16A	17	19	36	S11A	S11B	S12A	S12B	S13A	S16	S17	S19	S20	S22	S26	S36	S44A	S44B		S26A	S26B	Min.	Typ.	Max.		
f _V	Vertical free-run frequency	16	D SG18	9.0	9.0	0	0	9.0	4.5	0	-	0	0	0	-	0	0	-	0	0	-	0	0	0	0	0	0	0	0	0	Hz
f _{PV}	Vertical pull-in frequency	16	D SG20 Variable	9.0	9.0	0	0	9.0	4.5	0	-	0	0	0	-	0	0	-	0	0	-	0	0	0	0	0	55.6	56.6	57.6	Hz	
T _V	Vertical output pulse width (50Hz)	16	D SG17	9.0	9.0	0	0	9.0	4.5	0	-	0	0	0	-	0	0	-	0	0	-	0	0	0	0	494	544	594	μs		
V _{18H}	Vertical output maximum voltage	18	D SG17	9.0	9.0	0	0	3.7	9.0	4.5	0	-	0	0	0	-	0	0	-	0	0	-	0	0	0	4.2	5		V _{O-P}		
V _{18L}	Vertical output minimum voltage	18	D SG17	9.0	9.0	0	0	3.7	9.0	4.5	0	-	0	0	0	-	0	0	-	0	0	-	0	0	0	0	0	0.3	V _{O-P}		
G _{VV}	Vertical open loop gain	17 18	E SG19	-	-	-	-	3.7	9.0	0	-	-	-	-	0	-	-	-	0	-	-	-	0	-	-	16	22	28	dB		
V _{19 min}	Vertical oscillation starting voltage	16 19	-	9.0	9.0	0	0	-	4.5	0	-	0	0	0	-	0	0	-	0	0	-	0	0	0	0	5	6.5		V		
V _{RAMP}	Ramp peak voltage	16	D SG17	9.0	9.0	0	0	9.0	4.5	0	-	0	0	0	-	0	0	-	0	0	-	0	0	0	0	4.60	4.90	5.30	V _{O-P}		
V _{RAMP}	Ramp peak amplitude	16	D SG17	9.0	9.0	0	0	9.0	4.5	0	-	0	0	0	-	0	0	-	0	0	-	0	0	0	0	1.20	1.45	1.85	V _{P-P}		

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PAL SYSTEM SINGLE-CHIP COLOR TV SIGNAL PROCESSOR

VIDEO SECTION

Symbol	Parameter	Test Point	Input ()	Test conditions*																Limits			Unit								
				11A	16A	19A	21A	22A	29A	35A	38A	39A	40A	42A	S19A	S22A	S24A	S27A	S28A	S35A	S36A	S39A		S42A	S44A	Min.	Typ.	Max.			
Icc19	Circuit current	A19	--	--	9.0 V	--	--	4.5 V	--	2.7 V	--	--	○	○	--	--	○	--	--	--	--	--	30	40	50	mA					
Ymax	Maximum output	22	F SG21	--	9.0 V	--	--	9.0 V	--	Variable	--	--	○	○	--	--	--	--	--	--	--	--	5.0	6.2		VP-P					
GY	Standard gain	22	F SG22	--	9.0 V	--	--	4.5 V	--	Variable	--	--	○	○	--	--	--	--	--	--	--	--	11	15	19	dB					
GY min	Contrast control characteristics	22	F SG22	--	9.0 V	--	--	2.5 V	Variable	--	--	○	○	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
GY max																												+2	+6	+8.5	dB
VBRT-I-norm	Brightness control characteristics-I	22	D SG18	12 V	9.0 V	--	--	4.5 V	--	9.0 V	7.4 V	○	○	--	--	--	--	--	--	--	--	--	--	2.75	3.1	3.45	Vo-P				
VBRT-I-L																												2.25	2.6	2.95	Vo-P
VBRT-I-H																												3.05	3.4	3.75	Vo-P
VBRT-II-norm	Brightness control characteristics-II	22	D SG18	12 V	9.0 V	--	--	4.5 V	--	9.0 V	2.4 V	○	○	--	--	--	--	--	--	--	--	--	--	2.75	3.1	3.45	Vo-P				
VBRT-II-L																												1.65	2.0	2.35	Vo-P
VBRT-II-H																												3.85	4.2	4.55	Vo-P
GP	Peaking value	22	F SG23 SG24	--	9.0 V	--	--	4.5 V	--	Variable	--	--	○	○	--	--	--	--	--	--	--	--	7.5	11	14.5	dB					
GT norm	Video tone control characteristics	22	F SG24	--	9.0 V	--	--	4.5 V	Variable	4.5 V	--	○	○	--	--	--	--	--	--	--	--	--	--	--1.3	--0.5	1.2	dB				
GT min																												--21	--15	--11	dB
GT max																												3.0	6.0	10.0	dB
fB (γ)	Frequency characteristics	22	F SG25	--	9.0 V	--	--	4.5 V	--	Variable	--	--	○	○	--	--	--	--	--	--	--	--	7	8		MHz					
DGV	Differential gain	22	F SG22	--	9.0 V	--	--	4.5 V	--	Variable	--	--	○	○	--	--	--	--	--	--	--	--	--	1	6		%				
V40	Pin 40 voltage	40	--	--	9.0 V	--	--	4.5 V	--	M	○	○	○	○	○	○	○	○	○	○	○	○	4.15	4.45	4.75	V					
VBLK V	Vertical blanking voltage	22	--	12 V	9.0 V	--	--	2.5 V	--	Variable	--	--	○	○	--	--	--	--	--	--	--	--	7.3	7.7		Vo-P					
VBLK TV50	Vertical blanking pulse width	22	--	12 V	9.0 V	--	--	2.5 V	--	Variable	--	--	○	○	--	--	--	--	--	--	--	--	1.31	1.38	1.44	ms					
VBLK H	Horizontal blanking threshold voltage	22	H SG28	25A	9.0 V	--	Variable	2.5 V	--	Variable	--	--	○	○	○	○	○	○	○	○	○	○	6.35	6.8		Vo-P					
VDC REG	DC regeneration control characteristics	22	F SG17	--	9.0 V	--	--	4.5 V	--	9.0 V	--	--	○	○	--	--	--	--	--	--	--	--	--1.2	--0.2	1.0	V					

* : " " Indicates open.

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CHROMA SECTION 1

Symbol	Parameter	Test Point	Input ()	Test conditions*																	Limits			Unit											
				11A	16A	19 21	22A	29 36	38	39	40	42	S19	S19A	S22	S24	S27	S27A	S28	S28A	S29	S35	S36		S39	S42	Min.	Typ.	Max.						
C _{max}	Chroma maximum output	34	G SG26 0dB	12V	9.0V	6.5V	6.5V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	0.6	1.0	1.5	V _{P-P}				
G _c	Chroma maximum gain	34	G SG26 -26dB	12V	9.0V	6.5V	6.5V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	36	40	46	dB				
ACC - I	ACC characteristics	34	G SG26 -20dB	12V	9.0V	6.5V	4.5V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V			
ACC - II																																	-4	+0.6	+3.5
V _{ik}	Killer operation input level	G 21	G SG26 variable	12V	9.0V	6.5V	4.5V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	dB			
V _{ok}	Killer color residual	G 34	G SG26 0dB	12V	9.0V	6.5V	6.5V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	mV _{P-P}		
C _{norm}	Chroma standard output	G 34	G SG26 0dB	12V	9.0V	6.5V	6.5V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	V _{P-P}		
C _{s min}	Color control characteristics-I	G 34	G SG26 0dB	12V	9.0V	2.5V	6.5V	4.5V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	
C _{s max}																																			-46
C _{u min}	Color control characteristics-II	G 34	G SG26 0dB	12V	9.0V	2.5V	6.5V	4.5V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V
C _{u max}																																			
f _{PC L}	APC Pull-in range	G 21	G SG27 0dB	12V	9.0V	6.5V	4.5V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V
f _{PC H}																																			
f _{PC}	Total APC range	G	G SG27 0dB	12V	9.0V	6.5V	4.5V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	kHz	
V ₂₃	Demodulation output DC voltage	23A																																	V
V ₂₄		24A		12V	9.0V	6.5V	4.5V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	V
V ₂₅		25A		12V	9.0V	6.5V	4.5V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	V

* : "-" Indicates open.

CHROMA SECTION 2

Symbol	Parameter	Test Point	Input ()	Test conditions*																	Limits			Unit											
				11A	16A	19 21	22A	29 36	38	39	40	42	S19	S19A	S22	S24	S27	S27A	S28	S28A	S29	S35	S36		S39	S42	Min.	Typ.	Max.						
V ₂₃₋₂₄	** Demodulation output DC offset voltage	-																																	V
V ₂₄₋₂₅		-																																	V
V ₂₅₋₂₃		-																																	V
D _{max-P}	Demodulation output maximum amplitude	G 25A	G SG26 0dB	12V	9.0V	6.5V	6.5V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	V _{P-P}
D _{B-Y}	B-Y demodulation sensitivity	H 25A	H SG28 0.2 V _{P-P}	12V	9.0V	6.5V	4.5V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	V _{P-P}
$\frac{(R-Y)}{(B-Y)}_P$	Demodulation ratio	H 23A																																	-
$\frac{(G-Y)}{(B-Y)}_P$		H 25A	H SG28 0.2 V _{P-P}	12V	9.0V	6.5V	4.5V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	9.0V	-

* : "-" Indicates open.

** : Calculation.

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PAL SYSTEM SINGLE-CHIP COLOR TV SIGNAL PROCESSOR

CHROMA SECTION 2 (cont.)

Symbol	Parameter	Test Point	Input ()	Test conditions*																Limits			Unit														
				11A	16A	19	21	22A	29	36	38	39	40	42	S19	S19A	S22	S24	S27A	S28	S28A	S29		S35	S36	S39	S42	Min.	Typ.	Max.							
$\Delta DHR-Y$	Difference of demodulation output on line	23A	H SG28 0.2 VP-P	12V	9.0V	2.5V	2.5V	9.0V																									35	mVP-P			
$\Delta DHG-Y$		24A		12V	9.0V	2.5V	2.5V	9.0V																													
CLB-Y	Demodulation output carrier leak	25A		12V	9.0V	2.5V	2.5V	9.0V																									0.2	VP-P			
CLR-Y		23A		12V	9.0V	2.5V	2.5V	9.0V																													
CLG-Y		24A		12V	9.0V	2.5V	2.5V	9.0V																													
V21	Pin ② voltage	21	G SG26 0dB	12V	9.0V		4.5V	9.0V																						4.2	4.5	4.8		V			
V21K		21		12V	9.0V		4.5V	9.0V																							0.1	0.35		V			
DWR-Y	Demodulation output band width	23	H SG30	12V	9.0V		4.5V	9.0V																									0.8		1		MHz
DWG-Y		24		12V	9.0V		4.5V	9.0V																													
DWB-Y		25		12V	9.0V		4.5V	9.0V																													
Cin max	Chroma input dynamic range	G SG26 Variable 34	12V	9.0V		4.5V	9.0V																							1.0	1.4			VP-P			
$\angle R-Y-P$	Demodulation angle	23A	H SG28 0.2 VP-P	12V	9.0V		4.5V	9.0V																								90		deg.			
$\angle R-Y-P$		25A		12V	9.0V		4.5V	9.0V																													
$\angle G-Y-P$		25A		12V	9.0V		4.5V	9.0V																								240		deg.			

* : "-" Indicates open.

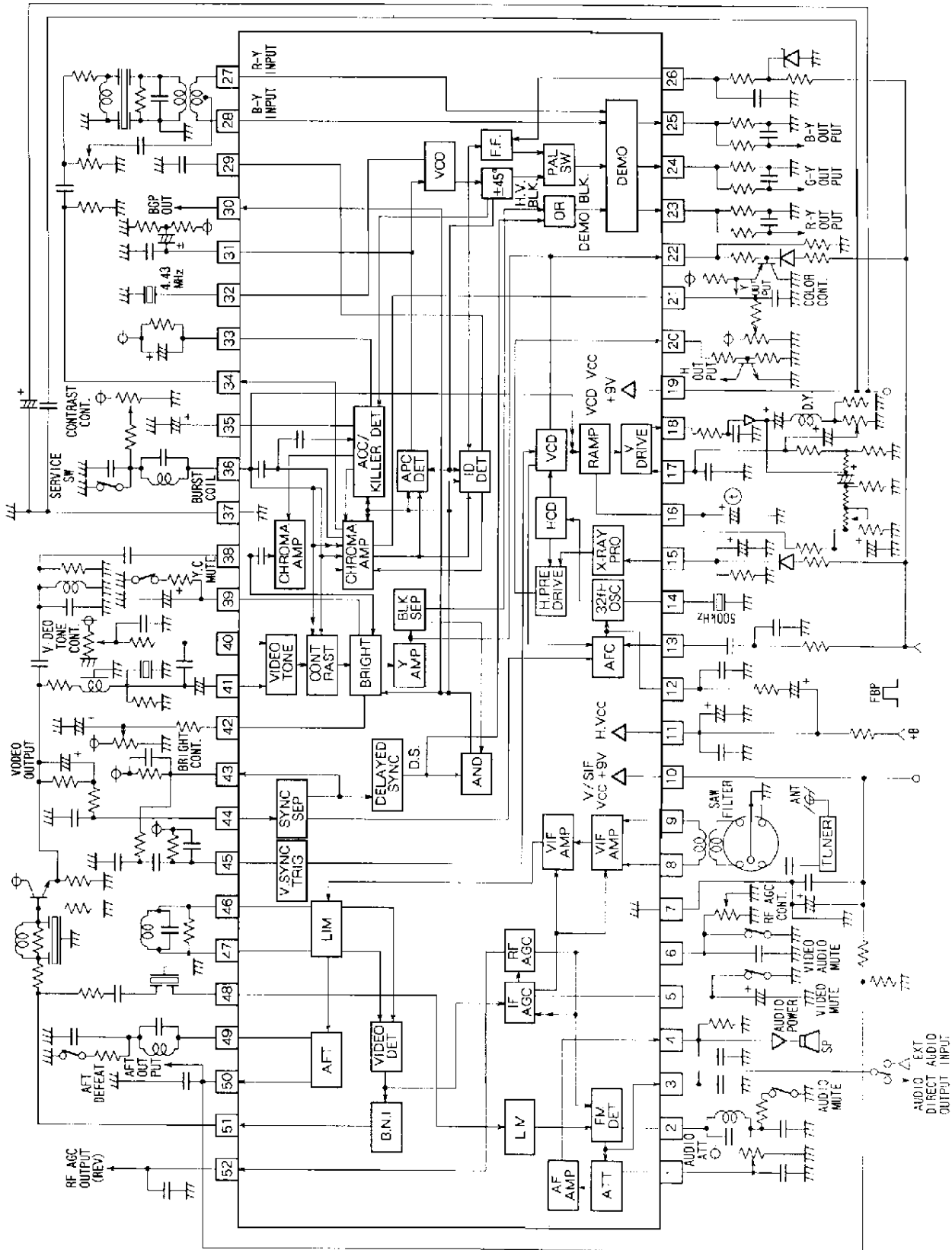
CHROMA SECTION 3

Symbol	Parameter	Test Point	Input ()	Test conditions*																Limits			Unit											
				11A	16A	19	21	22A	29	36	38	39	40	42	S19	S19A	S22	S24	S27A	S28	S28A	S29		S35	S36	S39	S42	Min.	Typ.	Max.				
$\Delta VP-C$	Color tracking characteristics	22	F SG22	12V	9.0V		4.0V 4.5V	9.0V	Variable																					-6	-2	+2		dB
		25A	G SG26 0dB	12V	9.0V		4.0V 4.5V	9.0V	Variable																									
SSy	Service switch operation color tracking	22	F SG22	12V	9.0V		4.0V 4.5V	9.0V	Variable																								100	mVP-P
SSc		34	G SG26 0dB	12V	9.0V		4.5V	9.0V	Variable																								100	mVP-P
SSv		16		12V	9.0V		4.5V	9.0V	Variable																								0.3	VO-P
CTS	Color tracking switch operation	G SG26 0dB 34	12V	9.0V		4.5V	9.0V																							3	6	9		dB
VMS	Video, chroma mute switch operation	22	F SG17	12V	9.0V		4.5V	9.0V																						5.6	6.2	6.8		VO-P
CMSR-Y		23A		12V	9.0V		4.5V	9.0V																										mVP-P
CMSG-Y		24A	G SG26 0dB	12V	9.0V		4.5V	9.0V																								100		mVP-P
CMSB-Y	25A		12V	9.0V		4.5V	9.0V																										mVP-P	

* : "-" Indicates open.

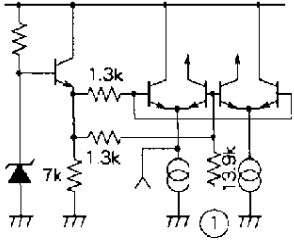
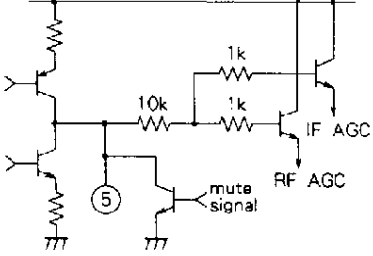
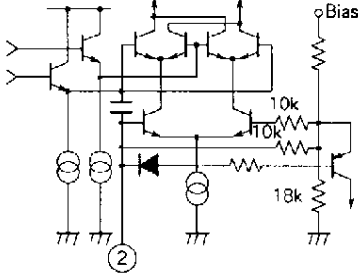
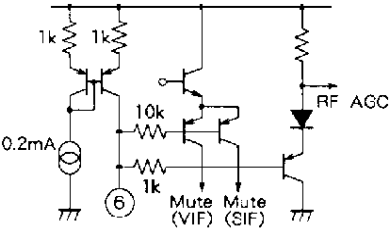
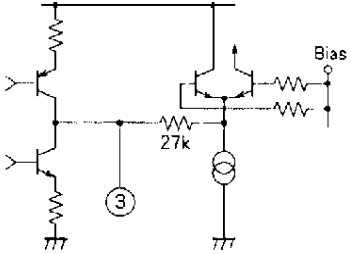
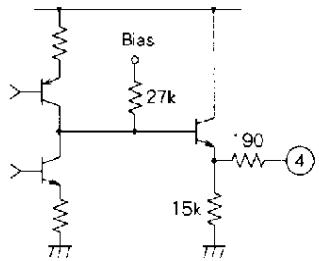
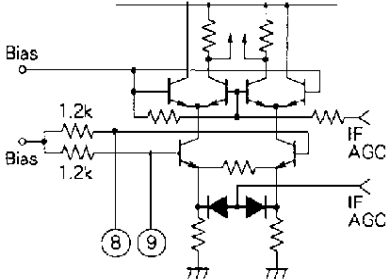
PAL SYSTEM SINGLE-CHIP COLOR TV SIGNAL PROCESSOR

TEST CIRCUIT



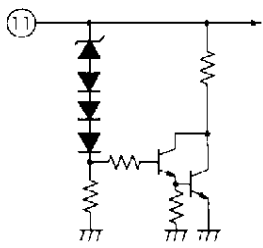
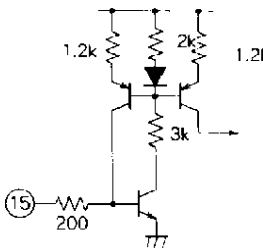
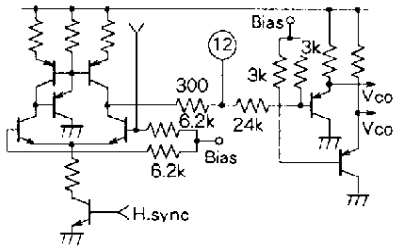
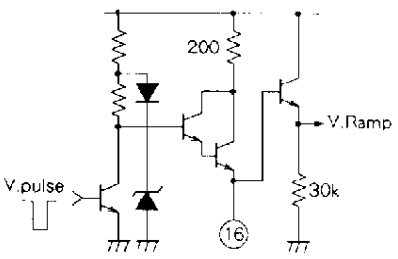
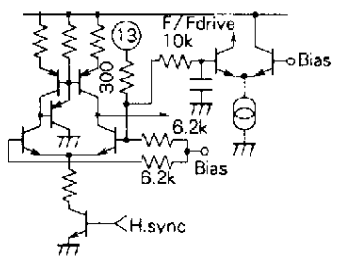
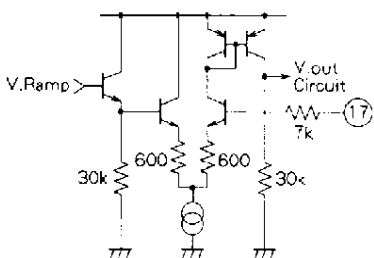
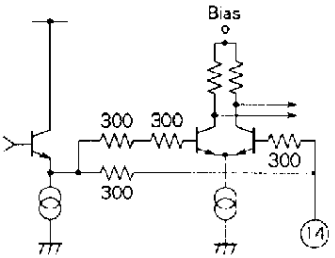
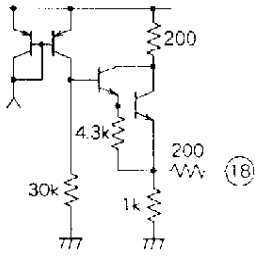
PAL SYSTEM SINGLE-CHIP COLOR TV SIGNAL PROCESSOR

DESCRIPTION OF PIN

Pin No.	Name	Peripheral circuit of pins	Pin No.	Name	Peripheral circuit of pins
①	ATT		⑤	IF AGC FILTER	
②	SOUND DET COIL		⑥	RF AGC DELAY ADJ.	
③	SOUND DET OUT		⑦	GND-1 (VIF SIF)	-
④	AF OUT		⑧	VIF IN	
			⑨	VIF IN	
			⑩	Vcc-1 (VIF SIF)	-

PAL SYSTEM SINGLE-CHIP COLOR TV SIGNAL PROCESSOR

DESCRIPTION OF PIN (cont.)

Pin No.	Name	Peripheral circuit of pins	Pin No.	Name	Peripheral circuit of pins
11	H.Vcc		15	X-RAY PROT	
12	AFC FILTER		16	RAMP	
13	AFC FBP IN		17	V.FB	
14	32FH OSC		18	V.OUT	
19	Vcc 2 (VCD)				

PAL SYSTEM SINGLE-CHIP COLOR TV SIGNAL PROCESSOR

DESCRIPTION OF PIN (cont.)

Pin No.	Name	Peripheral circuit of pins	Pin No.	Name	Peripheral circuit of pins
20	H.OUT		25	B-Y OUT	
21	COLOR CONT.		26	F. F. DRIVE PULSE IN	
22	-Y OUT		27	R-Y IN	
			28	B-Y IN	
23	R-Y OUT		29	IDENT FILTER	
24	G-Y OUT/ COLOR TRACKING SW				

PAL SYSTEM SINGLE-CHIP COLOR TV SIGNAL PROCESSOR

DESCRIPTION OF PIN (cont.)

Pin No.	Name	Peripheral circuit of pins	Pin No.	Name	Peripheral circuit of pins
30	BGP OUT		34	CHROMA OUT	
31	APC FILTER		35	KILLER FILTER	
32	CHROMA OSC		36	CONTRAST CONT. / BURST COIL	
33	ACC FILTER		37	GND-2 (VCD)	-
			38	CHROMA IN	
			39	PEDESTAL CLAMP	

PAL SYSTEM SINGLE-CHIP COLOR TV SIGNAL PROCESSOR

DESCRIPTION OF PIN (cont.)

Pin No.	Name	Peripheral circuit of pins	Pin No.	Name	Peripheral circuit of pins
40	VIDEO TONE CONT.		44	SYNC IN	
41	Y IN		45	V.SYNC IN	
42	BRIGHTNESS CONT.		46	VIDEO DET COIL	
43	SYNC OUT		47	VIDEO DET COIL	
			48	SIF IN	

PAL SYSTEM SINGLE-CHIP COLOR TV SIGNAL PROCESSOR

DESCRIPTION OF PIN (cont.)

Pin No.	Name	Peripheral circuit of pins
④⑨	AFT COIL	
⑤①	AFT OUT	
⑤①	VIDEO OUT	
⑤②	RF AGC OUT	