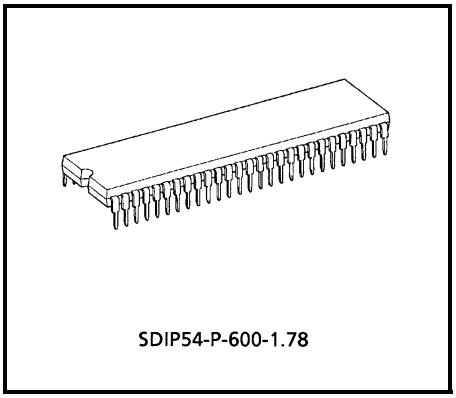
TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA8851BNG,TA8851CNG

AUDIO / VIDEO SWITCH IC FOR TV WITH S-TERMINALS

The TA8851BNG / CNG is an A / V SWITCH IC, which has 7 input channels and 2 output channels. Because the 2 output channels can be switched independently of each other, the TA8851BNG / CNG allows you to configure a PIP system input switching circuit easily.
The TA8851BNG / CNG can be interfaced easily to a microcontroller via the I^2C bus.
3 of 7 input channels can be used for Y / C separated input.



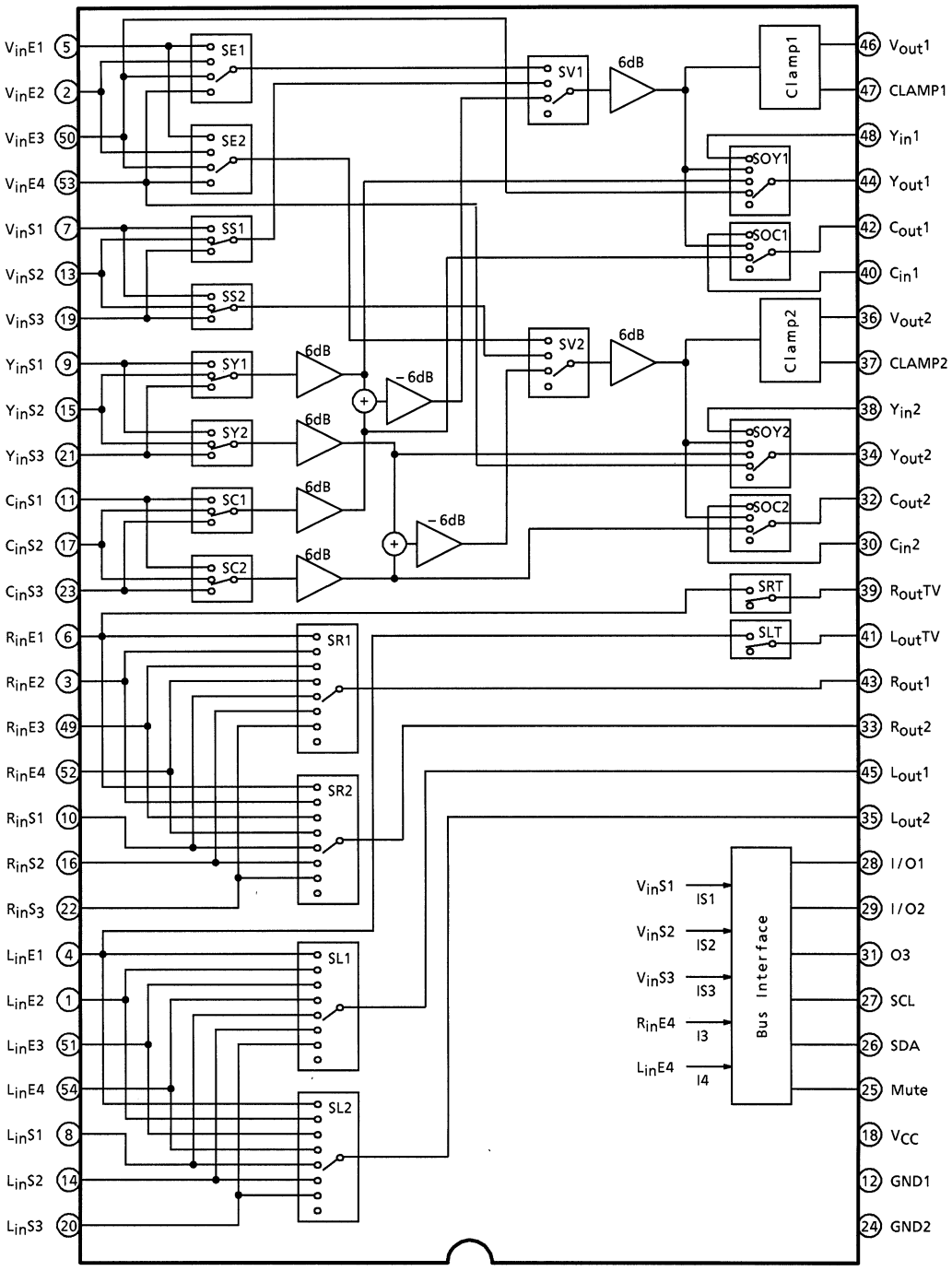
Weight: 5.44 g (Typ.)

FEATURES

- Video Stage
  - Input
    - Composite video input : 7 channels
    - Y / C input : 3 channels
  - Output
    - Composite video output : 2 channels (Main and Sub)
    - Y / C output : 2 channels (Main and Sub)
- Audio Stage
  - Input
    - L / R input : 7 channels
  - Output
    - L / R output : 3 channels (2 of 3 depend on video, and the other is selectable from Main or Sub)
- Functions
  - I^2C bus interface
  - External mute circuit
  - DAC output (3 outputs)
  - Video clamp circuit
  - Mode output
  - ADC input (4 inputs)

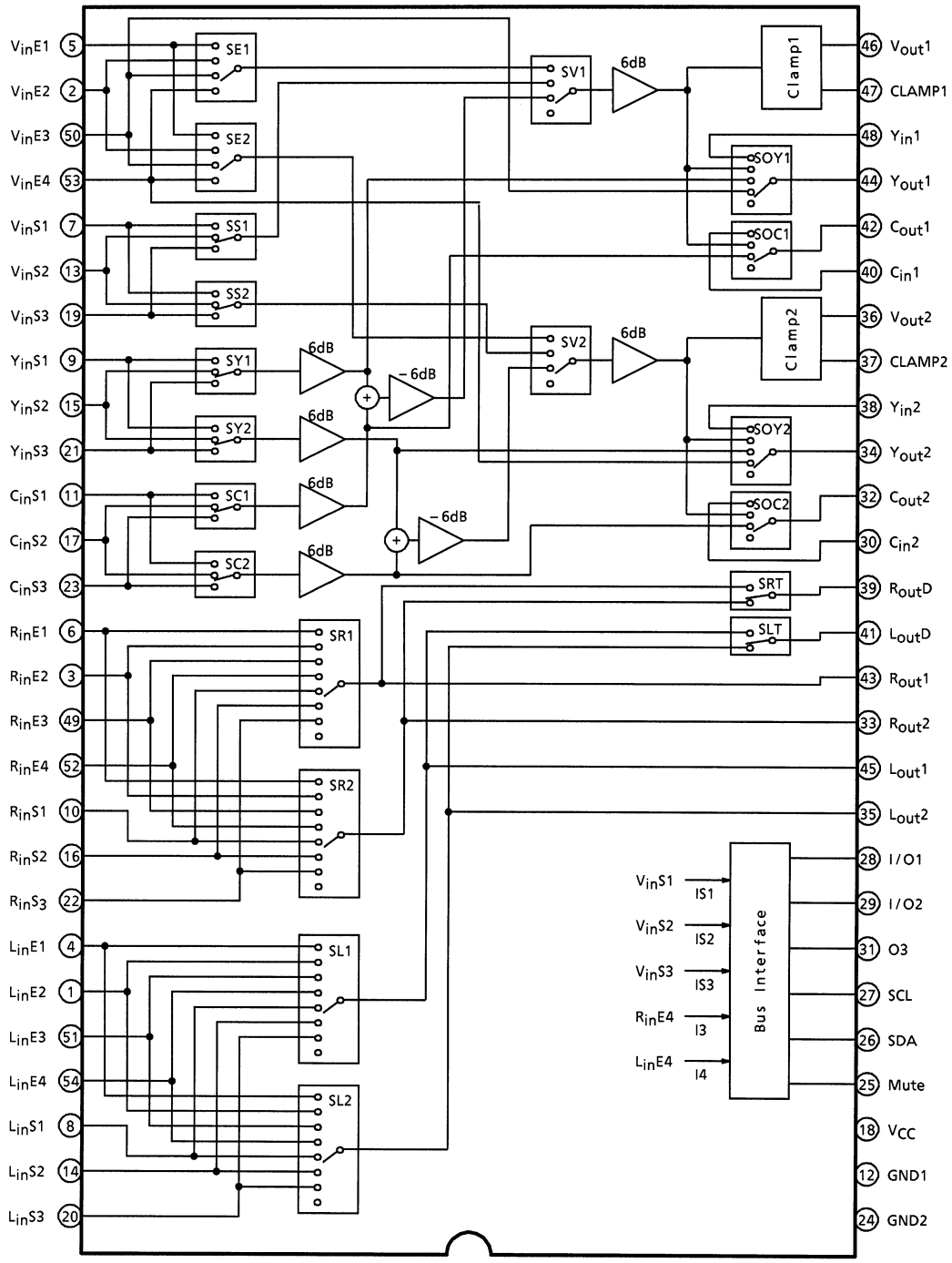
BLOCK DIAGRAM

TA8851BNG

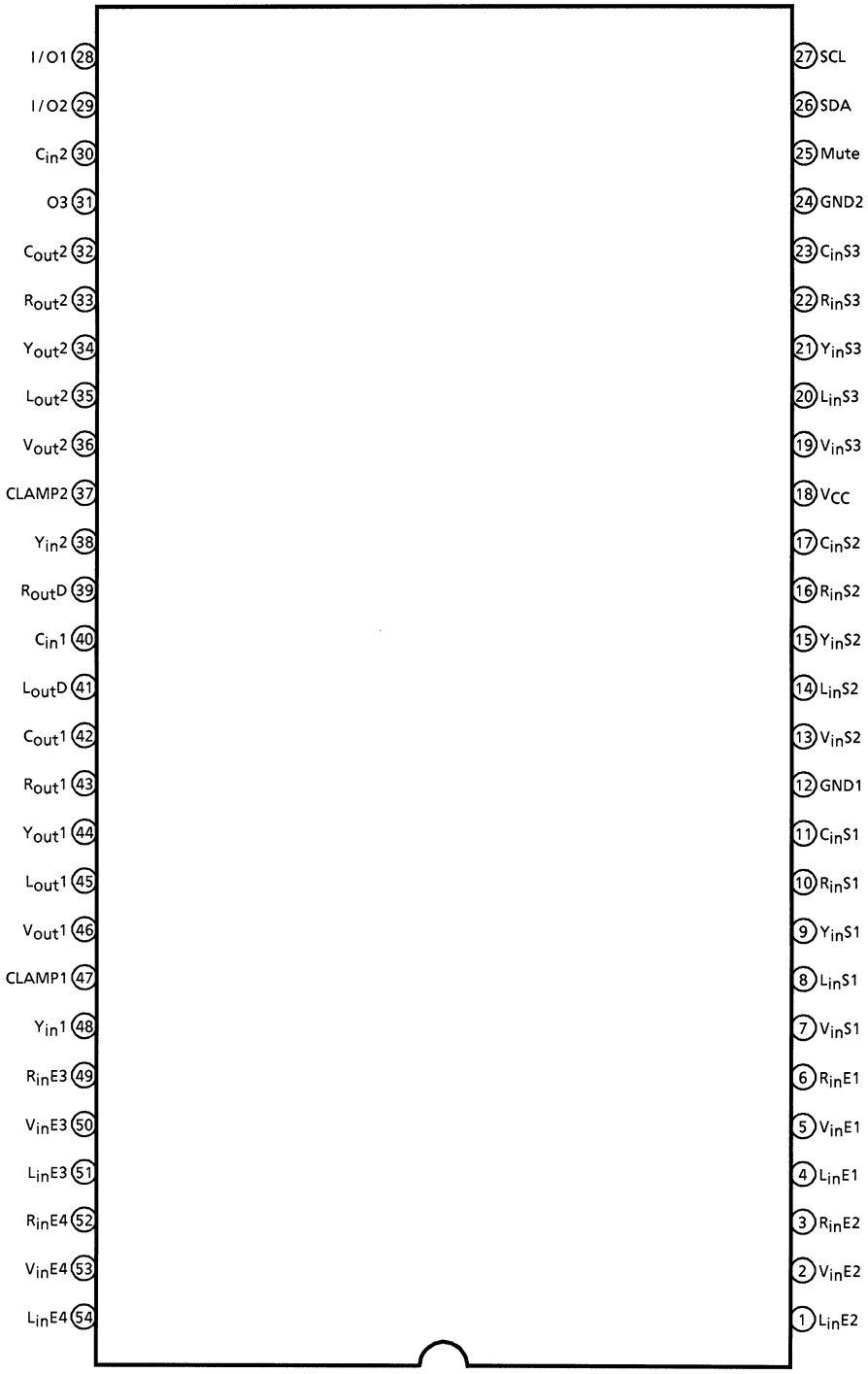


BLOCK DIAGRAM

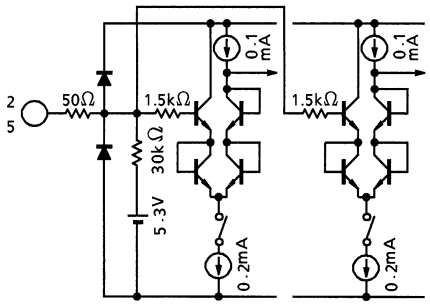
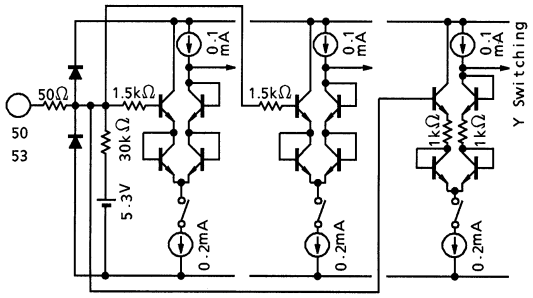
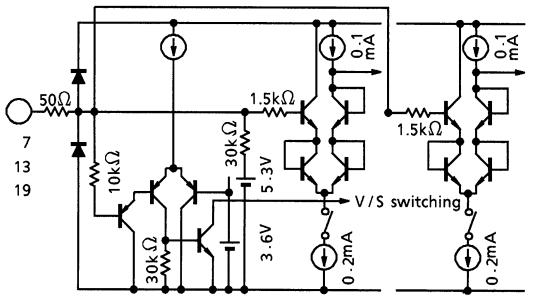
TA8851CNG

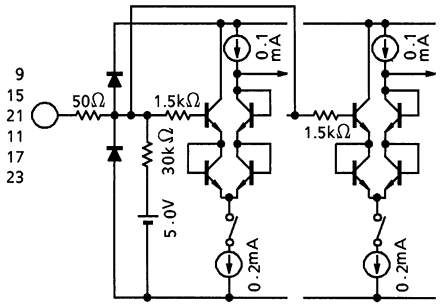
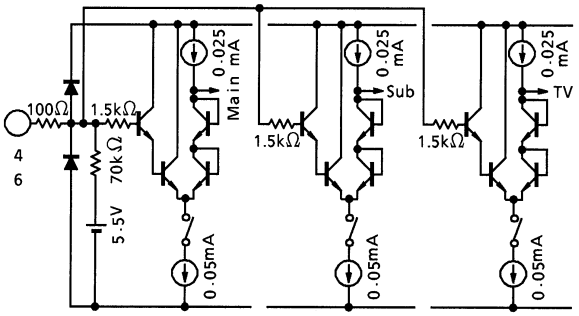
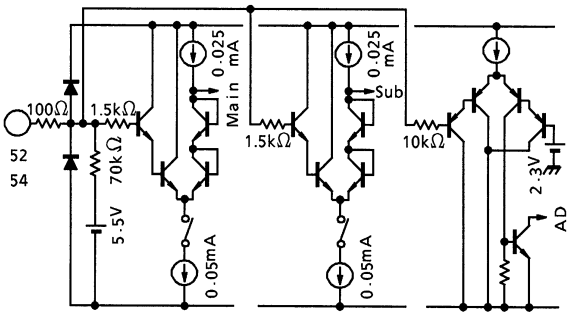
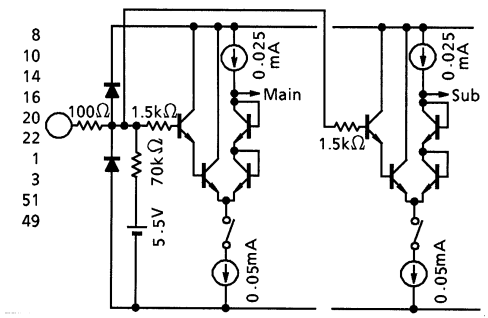


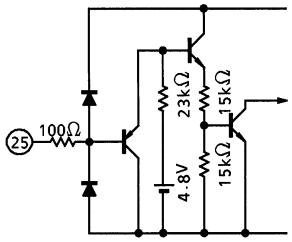
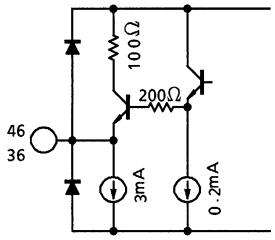
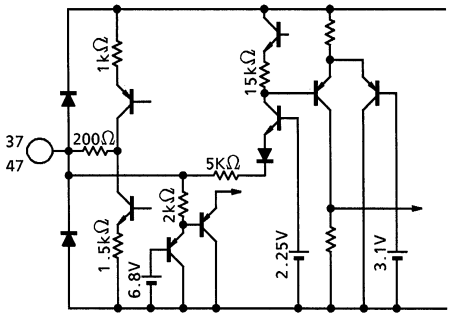
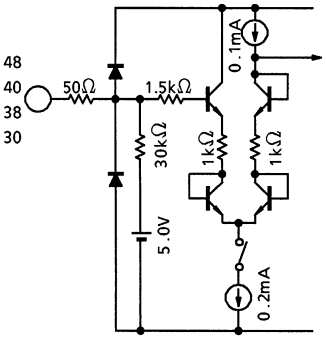
TERMINAL CONNECTION DIAGRAM

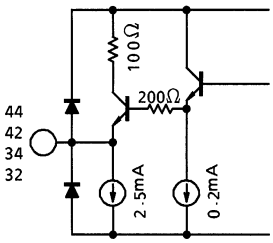
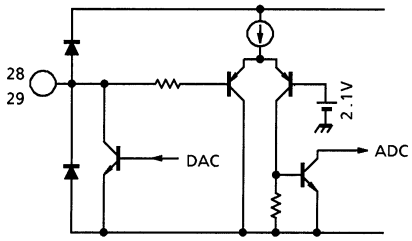
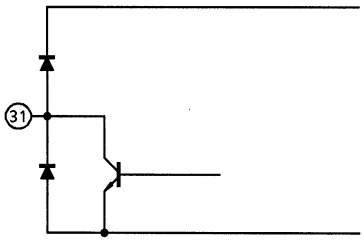
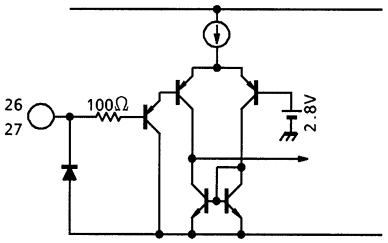
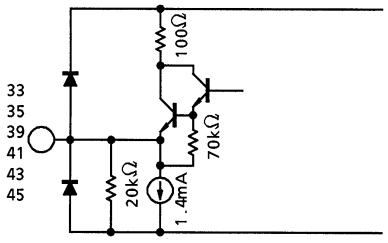


TERMINAL FUNCTION

PIN No.	PIN NAME	FUNCTION	INTERFACE CIRCUIT
2 : $V_{in}E2$ 5 : $V_{in}E1$	Composite Video Signal Input	These pins are for composite video signal input. The recommendable input level is $1.0V_{p-p}$.	
50 : $V_{in}E3$ 53 : $V_{in}E4$	Composite Video Signal / Y Signal Input	These pins can be used for composite video signal or Y signal input. The recommendable input level is $1.0V_{p-p}$.	
7 : $V_{in}S1$ 13 : $V_{in}S2$ 19 : $V_{in}S3$	Composite Video Signal Input and S-Mode Switch	These pins are for composite video signal input and S mode Switch. By setting DC voltage of one of these pins lower than 2.6V, that channel (S1, S2 or S3) turns to S-mode. And when it is higher than 2.6V, that pin is for composite video input. The recommendable input level is $1.0V_{p-p}$.	

PIN No.	PIN NAME	FUNCTION	INTERFACE CIRCUIT
9 : $Y_{in}S1$ 15 : $Y_{in}S2$ 21 : $Y_{in}S3$ 11 : $C_{in}S1$ 17 : $C_{in}S2$ 23 : $C_{in}S3$	Y Signal Input / C Signal Input	These pins accept a Y signal from the S-terminal and a C signal as input. The recommended input signal level is $1.0V_{p-p}$ for Y signal and $300mV_{p-p}$ for C signal (burst).	
4 : $L_{in}E1$ 6 : $R_{in}E1$	Audio Input (TV)	These pins accept the sound of the internal TV signal as input. The signal input to this pin is output from the main / sub output after being selected, as well as from the TV audio output terminal. The recommended input signal level is $300mV_{rms}$.	
52 : $R_{in}E4$ 54 : $L_{in}E4$	Audio Input / ADC Input	These pins accept an audio signal as input. They also accept input from a 1bit ADC. In this case, if the voltage on these pins is below 2.3V the ADC outputs I_3 and I_4 become logic is. The recommended input signal level is $300mV_{rms}$.	
8 : $L_{in}S1$ 10 : $R_{in}S1$ 14 : $L_{in}S2$ 16 : $R_{in}S2$ 20 : $L_{in}S3$ 22 : $R_{in}S3$ 1 : $L_{in}E2$ 3 : $R_{in}E2$ 51 : $L_{in}E3$ 49 : $R_{in}E3$	Audio Input	These pins accept an audio signal as input. The recommended input signal level is $300mV_{rms}$.	

PIN No.	PIN NAME	FUNCTION	INTERFACE CIRCUIT
25 : Mute	Mute	If the voltage on this pin is above 1.5V, all audio outputs (main, sub, and TV) are disabled.	
46 : $V_{out}1$ 36 : $V_{out}t2$	Monitor Output	These pins output the selected composite signal. The standard output signal amplitude is $2.0V_{p-p}$. These pins can sink a maximum current of 3.0mA.	
47 : CLAMP1 37 : CLAMP2	Clamp Filter	These pins are a filter terminal for the clamp circuit to maintain the monitor output at a constant DC level. If these pins are tied to GND, the clamp circuit is disabled, so that the DC voltage of the monitor output cannot be clamped to a constant level.	
48 : $Y_{in}1$ 40 : $C_{in}1$ 38 : $Y_{in}2$ 30 : $C_{in}2$	Comb Y / C Input	These pins accept a Y / C separated signal from the comb filter as input. The recommended input signal level is $2.0V_{p-p}$ for Y signal and $600mV_{p-p}$ for C signal (burst).	

PIN No.	PIN NAME	FUNCTION	INTERFACE CIRCUIT
44 : $Y_{out}1$ 42 : $C_{out}1$ 34 : $Y_{out}2$ 32 : $C_{out}2$	Y / C Output	These pins output the Y and C signals that are fed to the V / C / D circuits. The standard output signal level is $2.0V_{p-p}$ for Y signal and $600mV_{p-p}$ for C signal (burst). These pins can sink a maximum current of 2.5mA.	
28 : I / O1 29 : I / O2	I / O	These pins are for input and output to and from the 1bit DAC / ADC of the bus signal. These pins can source a maximum current of 2.0mA.	
31 : O3	O3	This pin is for output of the 1bit DAC of the bus signal. This pin can source a maximum current of 2.0mA.	
26 : SDA 27 : SCL	SCL / SDA	These pins are for input of the I^2C bus.	
33 : $R_{out}2$ 35 : $L_{out}2$ 39 : $R_{out}D$ / $R_{out}TV$ 41 : $L_{out}D$ / $L_{out}TV$ 43 : $R_{out}1$ 45 : $L_{out}1$	Audio Output	These pins output an audio signal. These pins can sink a maximum current of 1.4mA.	

ADDRESS MAP (Slave address 90H, 91H)

MODE	DATA No.	DATA							
Write	Data 1	D_{07}	D_{06}	D_{05}	D_{04}	D_{03}	D_{02}	D_{01}	D_{00}
	TA8851BNG	—		DAC Output			Sound Mute		
							(1)	(1)	(1)
	TA8851CNG			(0)	(1)	(1)	Dual Sound Output (1)	Sound Mute (1)	(1)
	Data 2 (main)	D_{17}	D_{16}	D_{15}	D_{14}	D_{13}	D_{12}	D_{11}	D_{10}
						F.VIDEO (0)			
	Data 3(sub)	D_{27}	D_{26}	D_{25}	D_{24}	D_{23}	D_{22}	D_{21}	D_{20}
		Y / C Output Switching				F.VIDEO	Output Switching		
		(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Read	Data 4	D_{37}	D_{36}	D_{35}	D_{34}	D_{33}	D_{32}	D_{31}	D_{30}
		ADC Ident				S Input Ident			P.O.R
		(0)	(0)	(0)	(0)	(0)	(0)	(0)	(1)

F.VIDEO : Forced video mode
P.O.R : Power On reset (power : ON (1))
(0) (1) : preset

Write mode

Output switching (main)

MODE			BUS DATA				S INPUT			OUTPUT SIGNAL		
			D_{13}	D_{12}	D_{11}	D_{10}	IS1	IS2	IS3	$V_{out}1$	$R_{out}1$	$L_{out}1$
TV	E1		—	1	1	1	—	—	—	$V_{in}E1$	$R_{in}E1$	$L_{in}E1$
	E2		—	1	1	0	—	—	—	$V_{in}E2$	$R_{in}E2$	$L_{in}E2$
	E3		—	1	0	1	—	—	—	$V_{in}E3$	$R_{in}E3$	$L_{in}E3$
	E4		—	1	0	0	—	—	—	$V_{in}E4$	$R_{in}E4$	$L_{in}E4$
	S1	V	0	0	1	1	0	—	—	$V_{in}S1$	$R_{in}S1$	$L_{in}S1$
		S	1				—			$Y_{in}S1$ + $C_{in}S1$		
			—				1					
	S2	V	0	0	1	0	—	0	—	$V_{in}S2$	$R_{in}S2$	$L_{in}S2$
		S	1					—		$Y_{in}S2$ + $C_{in}S2$		
			—					1				
	S3	V	0	0	0	1	—	—	0	$V_{in}S3$	$R_{in}S3$	$L_{in}S3$
		S	1						—	$Y_{in}S3$ + $C_{in}S3$		
			—						1			
Mute			—	0	0	0	—	—	—	Mute	Mute	Mute

Output switching (sub)

MODE			BUS DATA				S INPUT			OUTPUT SIGNAL		
			D_{23}	D_{22}	D_{21}	D_{20}	IS1	IS2	IS3	$V_{out}2$	$R_{out}2$	$L_{out}2$
TV	E1		—	1	1	1	—	—	—	$V_{in}E1$	$R_{in}E1$	$L_{in}E1$
	E2		—	1	1	0	—	—	—	$V_{in}E2$	$R_{in}E2$	$L_{in}E2$
	E3		—	1	0	1	—	—	—	$V_{in}E3$	$R_{in}E3$	$L_{in}E3$
	E4		—	1	0	0	—	—	—	$V_{in}E4$	$R_{in}E4$	$L_{in}E4$
	S1	V	0	0	1	1	0	—	—	$V_{in}S1$	$R_{in}S1$	$L_{in}S1$
		S	1				—			$Y_{in}S1$ + $C_{in}S1$		
			—				1					
	S2	V	0	0	1	0	—	0	—	$V_{in}S2$	$R_{in}S2$	$L_{in}S2$
		S	1					—		$Y_{in}S2$ + $C_{in}S2$		
			—					1				
	S3	V	0	0	0	1	—	—	0	$V_{in}S3$	$R_{in}S3$	$L_{in}S3$
		S	1						—	$Y_{in}S3$ + $C_{in}S3$		
			—						1			
Mute			—	0	0	0	—	—	—	Mute	Mute	Mute

Output switching (Dual sound output) : This table is only applied for TA8851CNG.

MODE		BUS DATA	OUTPUT SIGNAL	
		D_{02}	R_{out} TV	L_{out} TV
TV	Main	1	$R_{out}1$	$L_{out}1$
	Sub	0	$R_{out}2$	$L_{out}2$

Y / C output switching (main)

MODE		BUS DATA				OUTPUT SIGNAL	
		D_{17}	D_{16}	D_{15}	D_{14}	$Y_{out}1$	$C_{out}1$
Y	S-terminal Input	EXCEPT		1	1	$Y_{in}S1$ to $Y_{in}S3$ (*1)	—
	Video Input			1	0	$V_{out}1$	
	Comb1	0	0	0	1	$Y_{in}1$	
	Comb2			0	0	$V_{in}E3$	
C	S-terminal Input	1	1	—	—	—	$C_{in}S1$ to $C_{in}S3$ (*2)
	Video Input	1	0				$V_{out}1$
	Comb	0	1				$C_{in}1$
Mute		0	0	—	—	Mute	Mute

* 1: SY1 switches between $Y_{in}S1$~$Y_{in}S3$
* 2: SC1 switches between $C_{in}S1$~$C_{in}S3$

Y / C output switching (sub)

MODE		BUS DATA				OUTPUT SIGNAL	
		D_{27}	D_{26}	D_{25}	D_{24}	$Y_{out}2$	$C_{out}2$
Y	S-terminal Input	EXCEPT		1	1	$Y_{in}S1$ to $Y_{in}S3$ (*1)	—
	Video Input			1	0	$V_{out}2$	
	Comb1	0	0	0	1	$Y_{in}2$	
	Comb2			0	0	$V_{in}E4$	
C	S-terminal Input	1	1	—	—	—	$C_{in}S1$ to $C_{in}S3$ (*2)
	Video Input	1	0				$V_{out}2$
	Comb	0	1				$C_{in}2$
Mute		0	0	—	—	Mute	Mute

* 1: SY2 switches between $Y_{in}S1$~$Y_{in}S3$
* 2: SC2 switches between $C_{in}S1$~$C_{in}S3$

Mute mode

MODE			BUS		PIN 25	VIDEO OUTPUT				SOUND OUTPUT		
						MAIN		SUB		MAIN	SUB	Dual
			BIT	DATA		$V_{out}1$	$Y_{out}1$ $C_{out}1$	$V_{out}2$	$Y_{out}2$ $C_{out}2$	$R_{out}1$ $L_{out}1$	$R_{out}2$ $L_{out}2$	$R_{out}D$ $L_{out}D$
Ext Mute			—	—	High level	—	—	—	—	Mute	Mute	Mute
Bus Line Mute	Sound Mute SW	Main	D_{00}	1	—	—	—	—	—	Mute	—	—
		Sub	D_{01}	1	—	—	—	—	—	—	Mute	—
		TV (*)	D_{02}	1	—	—	—	—	—	—	—	Mute
	Video & Sound Mute SW	Main	D_{10} D_{11} D_{12}	0 0 0	—	Mute	—	—	—	Mute	—	—
		Sub	D_{20} D_{21} D_{22}	0 0 0	—	—	—	Mute	—	—	Mute	—
		Y / C main	D_{14} D_{15}	0 0	—	—	Mute	—	—	—	—	—
		Y / C Sub	D_{24} D_{25}	0 0	—	—	—	—	Mute	—	—	—

*: TV mode is only applied for TA8851BNG

DAC output

TERMINAL	BUS		OUTPUT
	BIT	DATA	
I / O1	D_{03}	1	Open
		0	Low level
I / O2	D_{04}	1	Open
		0	Low level
O3	D_{05}	1	Open
		0	Low level

Dual Sound Selection

TERMINAL	BUS		OUTPUT	
	BIT	DATA	$R_{out}D$	$L_{out}D$
MAIN	D_{02}	1	Main Sound	Main Sound
SUB		0	Sub Sound	Sub Sound

Read mode
S-Output ident

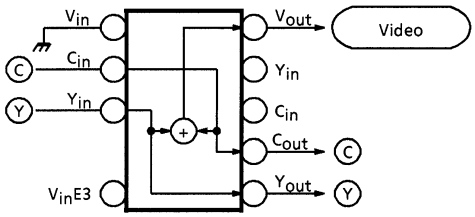
TERMINAL	INPUT	BUS	
		BIT	DATA
$V_{in}S1$	L	D_{31}	1
	H		0
$V_{in}S2$	L	D_{32}	1
	H		0
$V_{in}S3$	L	D_{33}	1
	H		0

ADC ident

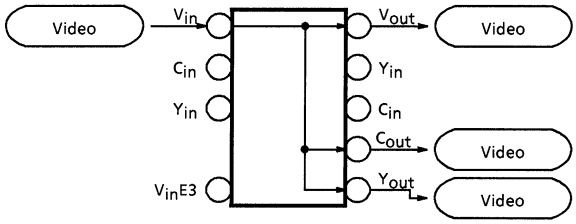
TERMINAL	INPUT	BUS	
		BIT	DATA
I / O1	L	D_{34}	1
	H		0
I / O2	L	D_{35}	1
	H		0
I3	L	D_{36}	1
	H		0
I4	L	D_{37}	1
	H		0

MODE EXPLANATION

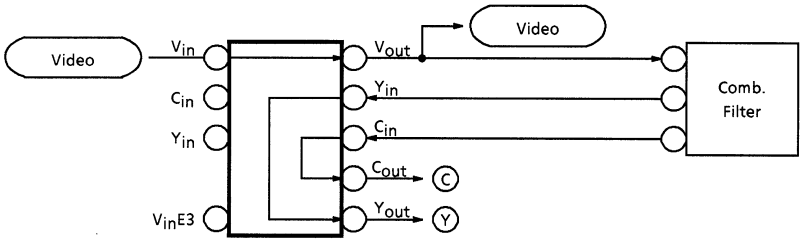
<S-terminal input mode>



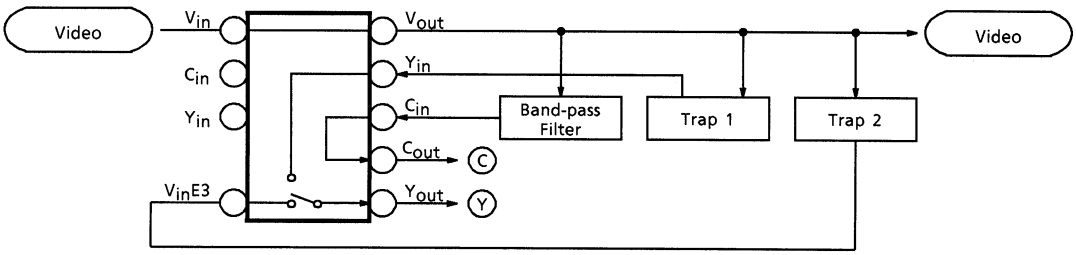
<Video input mode>



<Comb.1 input mode>



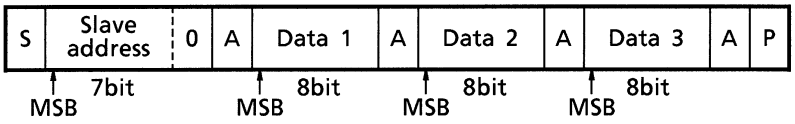
<Comb.2 input mode>



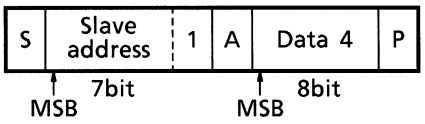
I²C BUS CONTROLLED FORMAT SUMMARY

Data transfer format

Write :

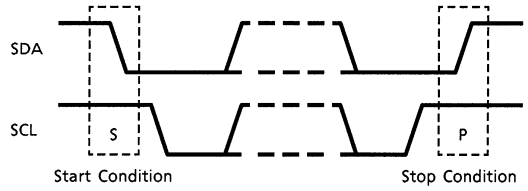


Read :

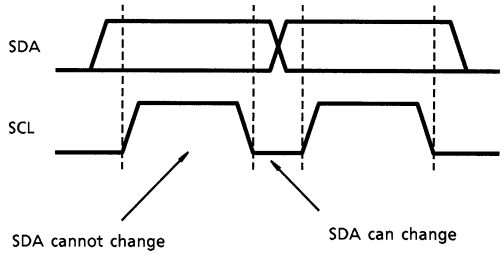


S : Start Condition
P : Stop Condition
A : Acknowledge

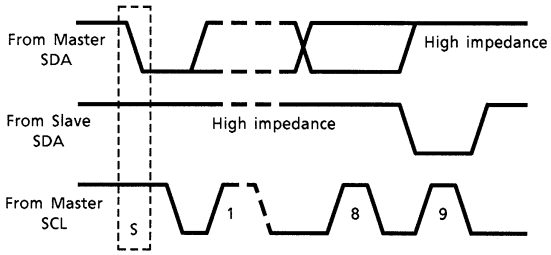
(1) Start condition, stop condition



(2) Bit transfer



(3) Acknowledge



(4) Slave address

A_6	A_5	A_4	A_3	A_2	A_1	A_0	R / $\overline{W}$
1	0	0	1	0	0	0	1/0

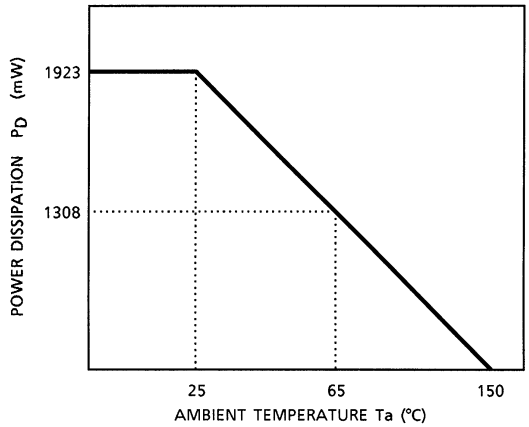
I^2C BUS Conditions

Characteristics	Symbol	Min	Typ.	Max	Unit
Low level input voltage	V_{IL}	0	—	1.5	V
High level input voltage	V_{IH}	2.7	—	Vcc	V
Low level output voltage at 3 mA sink current	V_{OL1}	0	—	0.4	V
Input current each I/O pin with an input voltage between 0.1 VDD and 0.9 VDD	I_i	−10	—	10	μA
Capacitance for each I/O pin	C_i	—	—	10	pF
SCL clock frequency	f_{SCL}	0	—	100	kHz
Hold time START condition	$t_{HD;STA}$	4.0	—	—	μs
Low period of SCL clock	t_{LOW}	4.7	—	—	μs
High period of SCL clock	t_{HIGH}	4.0	—	—	μs
Set-up time for a repeated START condition	$t_{SU;STA}$	4.7	—	—	μs
Data hold time	$t_{HD;DAT}$	100	—	—	ns
Data set-up time	$t_{SU;DAT}$	250	—	—	ns
Set-up time for STOP condition	$t_{SU;STO}$	4.0	—	—	μs
Bus free time between a STOP and START condition	t_{BUF}	4.7	—	—	μs

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	13	V
Input pin voltage	V_{in}	GND − 0.3~ V_{CC} + 0.3	V
Power Dissipation	$P_D$max	1923 (Note)	mW
Operating Temperature	T_{opr}	−20~65	°C
Storage Temperature	T_{stg}	−55~150	°C

Note: When using the device at above Ta = 25°C, decrease the power dissipation by 15.4mW for each increase of 1°C.



RECOMMENDED OPERATING CONDITION

PIN No.	PIN NAME	MIN	TYP.	MAX	UNIT
18	V_{CC}	8.1	9.0	9.9	V

ELECTRICAL CHARACTERISTICS
DC CHARACTERISTICS
DC voltage characteristics (Unless other wise specified, V_{CC} = 9V, Ta = 25°C)

PIN No.	PIN NAME	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
1	$L_{in}E2$	V_1	1	—	5.0	5.2	5.4	V
2	$V_{in}E2$	V_2		—	5.0	5.2	5.4	
3	$R_{in}E2$	V_3		—	5.0	5.2	5.4	
4	$L_{in}E1$	V_4		—	5.0	5.2	5.4	
5	$V_{in}E1$	V_5		—	5.0	5.2	5.4	
6	$R_{in}E1$	V_6		—	5.0	5.2	5.4	
7	$V_{in}S1$	V_7		—	5.0	5.2	5.4	
8	$L_{in}S1$	V_8		—	5.0	5.2	5.4	
9	$Y_{in}S1$	V_9		—	5.0	5.2	5.4	
10	$R_{in}S1$	V_{10}		—	5.0	5.2	5.4	
11	$C_{in}S1$	V_{11}		—	5.0	5.2	5.4	
13	$V_{in}S2$	V_{13}		—	5.0	5.2	5.4	
14	$L_{in}S2$	V_{14}		—	5.0	5.2	5.4	
15	$Y_{in}S2$	V_{15}		—	5.0	5.2	5.4	
16	$R_{in}S2$	V_{16}		—	5.0	5.2	5.4	
17	$C_{in}S2$	V_{17}		—	5.0	5.2	5.4	
19	$V_{in}S3$	V_{19}		—	5.0	5.2	5.4	
20	$L_{in}S3$	V_{20}		—	5.0	5.2	5.4	
21	$Y_{in}S3$	V_{21}		—	5.0	5.2	5.4	
22	$R_{in}S3$	V_{22}		—	5.0	5.2	5.4	
23	$C_{in}S3$	V_{23}		—	5.0	5.2	5.4	
25	MUTE	V_{25}		—	—	1.5	—	
26	SDA	V_{26}		—	—	4.2	—	
27	SCL	V_{27}		—	—	4.2	—	
28	I / O1	V_{28}		—	8.5	9.0	—	
29	I / O2	V_{29}		—	8.5	9.0	—	
30	$C_{in}2$	V_{30}		—	5.0	5.2	5.4	
31	O3	V_{31}		—	8.5	9.0	—	
32	$C_{out}2$	V_{32}		—	3.4	3.7	4.0	
33	$R_{out}2$	V_{33}		—	3.7	4.0	4.3	
34	$Y_{out}2$	V_{34}		—	3.4	3.7	4.0	
35	$L_{out}2$	V_{35}		—	3.7	4.0	4.3	
36	$V_{out}2$	V_{36}		—	2.3	2.8	3.3	
37	CLAMP2	V_{37}		—	2.7	3.2	3.7	
38	$Y_{in}2$	V_{38}		—	5.0	5.2	5.4	
39	$R_{out}TV$	V_{39}		—	3.7	4.0	4.3	
40	$C_{in}1$	V_{40}		—	5.0	5.2	5.4	
41	$L_{out}TV$	V_{41}		—	3.7	4.0	4.3	
42	$C_{out}1$	V_{42}		—	3.4	3.7	4.0	
43	$R_{out}1$	V_{43}		—	3.7	4.0	4.3	

PIN No.	PIN NAME	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
44	$Y_{out}1$	V_{44}	1	—	3.4	3.7	4.0	V
45	$L_{out}1$	V_{45}		—	3.7	4.0	4.3	
46	$V_{out}1$	V_{46}		—	2.3	2.8	3.3	
47	CLAMP1	V_{47}		—	2.7	3.2	3.7	
48	$Y_{in}1$	V_{48}		—	5.0	5.2	5.4	
49	$R_{in}E3$	V_{49}		—	5.0	5.2	5.4	
50	$V_{in}E3$	V_{50}		—	5.0	5.2	5.4	
51	$L_{in}E3$	V_{51}		—	5.0	5.2	5.4	
52	$R_{in}E4$	V_{52}		—	5.0	5.2	5.4	
53	$V_{in}E4$	V_{53}		—	5.0	5.2	5.4	
54	$L_{in}E4$	V_{54}		—	5.0	5.2	5.4	

DC current characteristics (Unless other wise specified, V_{CC} = 9V, Ta = 25°C)

PIN No.	PIN NAME	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
18	V_{CC}	I_{CC}	1	—	48	60	80	mA

AC CHARACTERISTICS (Unless other wise specified, V_{CC} = 9V, Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Clamp Current		I_{DIS}	2	Discharge current	11	17	28	μA
		I_{CHR}		charge current	0.50	1.25	1.80	mA
Output Resistance		$R_{M\text{-}AUD}$	2	—	50	100	150	Ω
		$R_{S\text{-}AUD}$		—	65	130	195	
		$R_{T\text{-}AUD}$		—	40	80	120	
		$R_{M\text{-}VID}$		—	25	50	75	
		$R_{S\text{-}VID}$		—	50	100	150	
		$R_{M\text{-}Y/C}$		—	25	50	75	
		$R_{S\text{-}Y/C}$		—	40	80	120	
Input Resistance		Ri_{AUD}	2	—	49	70	100	kΩ
		Ri_{VID}		—	20	30	40	
		$Ri_{Y/C}$		—	20	30	40	
Video Input Dynamic Range	(Main)	Vd_{VID1}	2	(Note 1)	1.6	2.1	—	$V_{p\text{-}p}$
	(Sub)	Vd_{VID2}			1.6	2.1	—	
	(Clamp off)	Vd_{VID3}			2.4	2.8	—	
Y / C Input Dynamic Range	(Main)	$Vd_{Y/C1}$	2	(Note 2)	2.4	2.8	—	$V_{p\text{-}p}$
	(Sub)	$Vd_{Y/C2}$			2.4	2.8	—	
Comb Input Dynamic Range	(Main)	Vd_{COM1}			5.1	6.5	—	
	(Sub)	Vd_{COM2}			5.1	6.5	—	
S Video Dynamic Range	(Main)	$Vd_{S\text{-}V1}$	2	(Note 3)	1.6	2.1	—	$V_{p\text{-}p}$
	(Sub)	$Vd_{S\text{-}V2}$			1.6	2.1	—	
	(Clamp off)	$Vd_{S\text{-}V3}$			2.4	2.8	—	
Monochrome Mode Dynamic Range	(Main)	$Vd_{B/W1}$	2	(Note 4)	1.6	2.1	—	$V_{p\text{-}p}$
	(Sub)	$Vd_{B/W2}$			1.6	2.1	—	

CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Video Gain	(Main)	$G_{VID}1$	2	(Note 5)	5.7	6.2	6.7	dB
	(Sub)	$G_{VID}2$			5.7	6.2	6.7	
	(Clamp Off)	$G_{VID}3$			5.8	6.3	6.8	
Y / C Gain	(Main)	$G_{Y/C}1$	2	(Note 6)	5.9	6.4	6.9	dB
	(Sub)	$G_{Y/C}2$			5.9	6.4	6.9	
Comb Gain	(Main)	$G_{COM}1$			−0.5	0	0.5	
	(Sub)	$G_{COM}2$			−0.5	0	0.5	
S Video Gain	(Main)	$G_{S-V}1$	2	(Note 7)	5.7	6.2	6.7	dB
	(Sub)	$G_{S-V}2$			5.7	6.2	6.7	
	(Clamp Off)	$G_{S-V}3$			6.0	6.5	7.0	
B / W Mode Gain	(Main)	$G_{B/W}1$	2	(Note 8)	5.7	6.2	6.7	dB
	(Sub)	$G_{B/W}2$			5.7	6.2	6.7	
Video Switch Crosstalk	(Main)	$C_{VID}1$	2	(Note 9)	50	60	—	dB
	(Sub)	$C_{VID}2$			50	60	—	
	(Clamp Off)	$C_{VID}3$		(Note 12)	50	60	—	
Y Switch Crosstalk	(Main)	C_Y1	2	(Note 10)	50	60	—	dB
	(Sub)	C_Y2			50	60	—	
C Switch Crosstalk	(Main)	C_C1	2	(Note 11)	50	60	—	dB
	(Sub)	C_C2			50	60	—	
Video Mute Attenuation		G_{VM}	2	(Note 13)	50	60	—	—
Video Frequency Response	(Main)	$f_{VID}1$	2	(Note 14)	9.0	—	—	MHz
	(Sub)	$f_{VID}2$			9.0	—	—	
	(Clamp Off)	$f_{VID}3$			9.0	—	—	
Y / C Frequency Response	(Main)	$f_{Y/C}1$	2	(Note 15)	9.0	—	—	MHz
	(Sub)	$f_{Y/C}2$			9.0	—	—	
Comb Frequency Response	(Main)	$f_{COM}1$			9.0	—	—	
	(Sub)	$f_{COM}2$			9.0	—	—	
S Video Frequency Response	(Main)	$f_{S-V}1$	2	(Note 16)	9.0	—	—	MHz
	(Sub)	$f_{S-V}2$			9.0	—	—	
	(Clamp Off)	$f_{S-V}3$			9.0	—	—	
B / W Mode Frequency Response	(Main)	$f_{B/W}1$	2	(Note 17)	9.0	—	—	MHz
	(Sub)	$f_{B/W}2$			9.0	—	—	
Clamp Level		C_L	2	(Note 18)	—	21	—	%
Audio Dynamic Range		Vd_{AUD}	2	(Note 19)	5.0	6.0	—	V_{p-p}
Audio Gain		G_{AUD}	2	(Note 20)	−0.5	0	0.5	dB
Audio Frequency Response		f_{AUD}	2	(Note 21)	0.1	3.0	—	MHz
Audio Switch Crosstalk		C_{AUD}	2	(Note 22)	60	70	—	dB
Audio Mute Attenuation		G_{AM}	2	(Note 23)	60	70	—	dB
Audio Select Offset		ΔV_{AUD}	2	(Note 24)	−30	0	30	mV
S Input Discriminating Voltage		V_{thS}	2	(Note 25)	2.4	2.6	2.8	V
ADC Input Discriminating Voltage		V_{thADC}	2	(Note 26)	1.8	2.3	2.8	V
External Mute-ON Voltage		V_{thMUTE}	2	(Note 27)	1.0	1.5	2.0	V
DAC Output Low Level Voltage		V_{DAC}	2	(Note 28)	0	—	0.5	V

TEST CONDITION

NOTE	ITEM		MEASURING CONDITIONS (UNLESS OTHERWISE SPECIFIED, V_{CC} = 9V, Ta = 25±3°C)		
			SW & VR MODE		MEASUREMENT METHOD
			SW MODE	DATA 2	
1-(1)	V Input Dynamic Range (Main)	$V_{in}E2$ $V_{in}E1$ $V_{in}S1$ $V_{in}S2$ $V_{in}S3$ $V_{in}E3$ $V_{in}E4$	S_2-a , others-b / off S_5-a , others-b / off S_{7A}-a , others-b / off S_{13A}-a , others-b / off S_{19A}-a , others-b / off S_{50}-a , others-b / off S_{53}-a , others-b / off	****0110 ****0111 ****0011 ****0010 ****0001 ****0101 ****0100	(1) V_1 15kHz, variable-amplitude input. (2) For each, measure the amplitude of V_1 at which the waveform on pin 46 is distorted.
1-(2)	V Input Dynamic Range (Sub)	$V_{in}E2$ $V_{in}E1$ $V_{in}S1$ $V_{in}S2$ $V_{in}S3$ $V_{in}E3$ $V_{in}E4$	S_2-a , others-b / off S_5-a , others-b / off S_{7A}-a , others-b / off S_{13A}-a , others-b / off S_{19A}-a , others-b / off S_{50}-a , others-b / off S_{53}-a , others-b / off	DATA 3 ****0110 ****0111 ****0011 ****0010 ****0001 ****0101 ****0100	(1) V_1 15kHz, Variable-amplitude input. (2) For each, measure the amplitude of V_1 at which the waveform on pin 36 is distorted.
1-(3)	V Input Dynamic Range (Clamp Off) (Main)	$V_{in}E2$ $V_{in}E1$ $V_{in}S1$ $V_{in}S2$ $V_{in}S3$ $V_{in}E3$ $V_{in}E4$	S_2-a , S_{47}-on, others-b / off S_5-a , S_{47}-on, others-b / off S_{7A}-a , S_{47}-on, others-b / off S_{13A}-a , S_{47}-on, others-b / off S_{19A}-a , S_{47}-on, others-b / off S_{50}-a , S_{47}-on, others-b / off S_{53}-a , S_{47}-on, others-b / off	DATA 2 ****0110 ****0111 ****0011 ****0010 ****0001 ****0101 ****0100	(1) V_1 15kHz, Variable-amplitude input, V_3 = 0V. (2) For each, measure the amplitude of V_1 at which the waveform on pin 46 is distorted.
1-(4)	V Input Dynamic Range (Clamp Off) (Sub)	$V_{in}E2$ $V_{in}E1$ $V_{in}S1$ $V_{in}S2$ $V_{in}S3$ $V_{in}E3$ $V_{in}E4$	S_2-a , S_{37}-on, others-b / off S_5-a , S_{37}-on, others-b / off S_{7A}-a , S_{37}-on, others-b / off S_{13A}-a , S_{37}-on, others-b / off S_{19A}-a , S_{37}-on, others-b / off S_{50}-a , S_{37}-on, others-b / off S_{53}-a , S_{37}-on, others-b / off	DATA 3 ****0110 ****0111 ****0011 ****0010 ****0001 ****0101 ****0100	(1) V_1 15kHz, variable-amplitude input, V_3 = 0V. (2) For each, measure the amplitude of V_1 at which the waveform on pin 36 is distorted.

NOTE	ITEM		MEASURING CONDITIONS (UNLESS OTHERWISE SPECIFIED, V_{CC} = 9V, Ta = 25±3°C) SW & VR MODE SW MODE	DATA 2	MEASUREMENT METHOD
2-(1)	YC Input Dynamic Range (Main)	$Y_{in}S1$ $Y_{in}S2$ $Y_{in}S3$	S_9-a , others-b / off S_{15}-a , others-b / off S_{21}-a , others-b / off S_{48}-a , others-b / off S_{50}-a , others-b / off	11111011 11111010 11111001 0101**** 0100****	Measure the amplitude in the same way using pin 44.
		$Y_{in}1$ $V_{in}E3$			
		$C_{in}S1$ $C_{in}S2$ $C_{in}S3$	S_{11}-a , others-b / off S_{17}-a , others-b / off S_{23}-a , others-b / off S_{40}-a , others-b / off	11111011 11111010 11111001 0101****	Measure the amplitude in the same way using pin 42.
		$C_{in}1$			
2-(2)	YC Input Dynamic Range (Sub)			DATA 3	Measure the amplitude in the same way using pin 34
		$Y_{in}S1$ $Y_{in}S2$ $Y_{in}S3$	S_9-a , others-b / off S_{15}-a , others-b / off S_{21}-a , others-b / off S_{38}-a , others-b / off S_{53}-a , others-b / off	11111011 11111010 11111001 0101**** 0100****	
		$Y_{in}2$ $V_{in}E4$			
		$C_{in}S1$ $C_{in}S2$ $C_{in}S3$	S_{11}-a , others-b / off S_{17}-a , others-b / off S_{23}-a , others-b / off S_{30}-a , others-b / off	11111011 11111010 11111001 0101****	Measure the amplitude in the same way using pin 32.
		$C_{in}2$			
3-(1)	S Video Dynamic Range (Main)			DATA 2	Measure the amplitude in the same way using pin 46.
		$Y_{in}S1$ $Y_{in}S2$ $Y_{in}S3$ $C_{in}S1$ $C_{in}S2$ $C_{in}S3$	S_9-a , others-b / off S_{15}-a , others-b / off S_{21}-a , others-b / off S_{11}-a , others-b / off S_{17}-a , others-b / off S_{23}-a , others-b / off	11111011 11111010 11111001 11111011 11111010 11111001	
3-(2)	S Video Dynamic Range (Sub)			DATA 3	Measure the amplitude in the same way using pin 36.
		$Y_{in}S1$ $Y_{in}S2$ $Y_{in}S3$ $C_{in}S1$ $C_{in}S2$ $C_{in}S3$	S_9-a , others-b / off S_{15}-a , others-b / off S_{21}-a , others-b / off S_{11}-a , others-b / off S_{17}-a , others-b / off S_{23}-a , others-b / off	11111011 11111010 11111001 11111011 11111010 11111001	

NOTE	ITEM		MEASURING CONDITIONS (UNLESS OTHERWISE SPECIFIED, V_{CC} = 9V, Ta = 25±3°C) SW & VR MODE SW MODE	DATA 2	MEASUREMENT METHOD
3-(3)	S Video Dynamic Range (Clamp Off) (Main)	$Y_{in}S1$ $Y_{in}S2$ $Y_{in}S3$ $C_{in}S1$ $C_{in}S2$ $C_{in}S3$	S_9-a , S_{47}-on, others-b / off S_{15}-a , S_{47}-on, others-b / off S_{21}-a , S_{47}-on, others-b / off S_{11}-a , S_{47}-on, others-b / off S_{17}-a , S_{47}-on, others-b / off S_{23}-a , S_{47}-on, others-b / off	11111011 11111010 11111001 11111011 11111010 11111001	Measure the amplitude in the same way using pin 46.
3-(4)	S Video Dynamic Range (Clamp Off) (Sub)	$Y_{in}S1$ $Y_{in}S2$ $Y_{in}S3$ $C_{in}S1$ $C_{in}S2$ $C_{in}S3$	S_9-a , S_{37}-on, others-b / off S_{15}-a , S_{37}-on, others-b / off S_{21}-a , S_{37}-on, others-b / off S_{11}-a , S_{37}-on, others-b / off S_{17}-a , S_{37}-on, others-b / off S_{23}-a , S_{37}-on, others-b / off	DATA 3 11111011 11111010 11111001 11111011 11111010 11111001	Measure the amplitude in the same way using pin 36.
4-(1)	B / W Mode Dynamic Range (Main)	$V_{in}E2$ $V_{in}E1$ $V_{in}S1$ $V_{in}S2$ $V_{in}S3$ $V_{in}E3$ $V_{in}E4$	S_2-a , others-b / off S_5-a , others-b / off S_{7A}-a , others-b / off S_{13A}-a , others-b / off S_{19A}-a , others-b / off S_{50}-a , others-b / off S_{53}-a , others-b / off	DATA 2 10100110 10100111 10100011 10100010 10100001 10100101 10100100	Measure the amplitude in the same way using pins 44 and 42 to find the smaller one.
4-(2)	B / W Mode Dynamic Range (Sub)	$V_{in}E2$ $V_{in}E1$ $V_{in}S1$ $V_{in}S2$ $V_{in}S3$ $V_{in}E3$ $V_{in}E4$	S_2-a , others-b / off S_5-a , others-b / off S_{7A}-a , others-b / off S_{13A}-a , others-b / off S_{19A}-a , others-b / off S_{50}-a , others-b / off S_{53}-a , others-b / off	DATA 3 10100110 10100111 10100011 10100010 10100001 10100101 10100100	Measure the amplitude in the same way using pins 34 and 32 to find the smaller one.

NOTE	ITEM		MEASURING CONDITIONS (UNLESS OTHERWISE SPECIFIED, V_{CC} = 9V, Ta = 25±3°C) SW & VR MODE SW MODE	DATA 2	MEASUREMENT METHOD
5-(1)	Video Gain (Main)	$V_{in}E2$ $V_{in}E1$ $V_{in}S1$ $V_{in}S2$ $V_{in}S3$ $V_{in}E3$ $V_{in}E4$	S_2-a , others-b / off S_5-a , others-b / off S_{7A}-a , others-b / off S_{13A}-a , others-b / off S_{19A}-a , others-b / off S_{50}-a , others-b / off S_{53}-a , others-b / off	****0110 ****0111 ****0011 ****0010 ****0001 ****0101 ****0100	(1) V_1 15kHz, $1V_{p-p}$ input. (2) For each, measure the amplitude on pin 46 to find the gain.
5-(2)	Video Gain (Sub)	$V_{in}E2$ $V_{in}E1$ $V_{in}S1$ $V_{in}S2$ $V_{in}S3$ $V_{in}E3$ $V_{in}E4$	S_2-a , others-b / off S_5-a , others-b / off S_{7A}-a , others-b / off S_{13A}-a , others-b / off S_{19A}-a , others-b / off S_{50}-a , others-b / off S_{53}-a , others-b / off	DATA 3 ****0110 ****0111 ****0011 ****0010 ****0001 ****0101 ****0100	(1) V_1 15kHz, $1V_{p-p}$ input. (2) For each, measure the amplitude on pin 36 to find the gain.
5-(3)	Video Gain (Clamp Off) (Main)	$V_{in}E2$ $V_{in}E1$ $V_{in}S1$ $V_{in}S2$ $V_{in}S3$ $V_{in}E3$ $V_{in}E4$	S_2-a , S_{47}-on, others-b / off S_5-a , S_{47}-on, others-b / off S_{7A}-a , S_{47}-on, others-b / off S_{13A}-a , S_{47}-on, others-b / off S_{19A}-a , S_{47}-on, others-b / off S_{50}-a , S_{47}-on, others-b / off S_{53}-a , S_{47}-on, others-b / off	DATA 2 ****0110 ****0111 ****0011 ****0010 ****0001 ****0101 ****0100	(1) V_1 15kHz, $1V_{p-p}$ input. (2) For each, measure the amplitude on pin 46 to find the gain.
5-(4)	Video Gain (Clamp Off) (Sub)	$V_{in}E2$ $V_{in}E1$ $V_{in}S1$ $V_{in}S2$ $V_{in}S3$ $V_{in}E3$ $V_{in}E4$	S_2-a , S_{37}-on, others-b / off S_5-a , S_{37}-on, others-b / off S_{7A}-a , S_{37}-on, others-b / off S_{13A}-a , S_{37}-on, others-b / off S_{19A}-a , S_{37}-on, others-b / off S_{50}-a , S_{37}-on, others-b / off S_{53}-a , S_{37}-on, others-b / off	DATA 3 ****0110 ****0111 ****0011 ****0010 ****0001 ****0101 ****0100	(1) V_1 15kHz, $1V_{p-p}$ input. (2) For each, measure the amplitude on pin 36 to find the gain.

NOTE	ITEM		MEASURING CONDITIONS (UNLESS OTHERWISE SPECIFIED, V_{CC} = 9V, Ta = 25±3°C) SW & VR MODE SW MODE	DATA 2	MEASUREMENT METHOD
6-(1)	Y / C Gain (Main)	$Y_{in}S1$ $Y_{in}S2$ $Y_{in}S3$	S_9-a , others-b / off S_{15}-a , others-b / off S_{21}-a , others-b / off S_{48}-a , others-b / off S_{50}-a , others-b / off	11111011 11111010 11111001 0101**** 0100****	Measure the amplitude in the same way using pin 44.
		$Y_{in}1$ $V_{in}E3$			
		$C_{in}S1$ $C_{in}S2$ $C_{in}S3$	S_{11}-a , others-b / off S_{17}-a , others-b / off S_{23}-a , others-b / off S_{40}-a , others-b / off	11111011 11111010 11111001 0101****	Measure the amplitude in the same way using pin 42.
		$C_{in}1$			
6-(2)	Y / C Gain (Sub)			DATA 3	
		$Y_{in}S1$ $Y_{in}S2$ $Y_{in}S3$	S_9-a , others-b / off S_{15}-a , others-b / off S_{21}-a , others-b / off S_{38}-a , others-b / off S_{53}-a , others-b / off	11111011 11111010 11111001 0101**** 0100****	Measure the amplitude in the same way using pin 34
		$Y_{in}2$ $V_{in}E4$			
		$C_{in}S1$ $C_{in}S2$ $C_{in}S3$	S_{11}-a , others-b / off S_{17}-a , others-b / off S_{23}-a , others-b / off S_{30}-a , others-b / off	11111011 11111010 11111001 0101****	Measure the amplitude in the same way using pin 32.
		$C_{in}2$			
7-(1)	S Video Gain (Main)			DATA 2	
		$Y_{in}S1$ $Y_{in}S2$ $Y_{in}S3$ $C_{in}S1$ $C_{in}S2$ $C_{in}S3$	S_9-a , others-b / off S_{15}-a , others-b / off S_{21}-a , others-b / off S_{11}-a , others-b / off S_{17}-a , others-b / off S_{23}-a , others-b / off	11111011 11111010 11111001 11111011 11111010 11111001	Measure the amplitude in the same way using pin 46.
7-(2)	S Video Gain (Sub)			DATA 3	
		$Y_{in}S1$ $Y_{in}S2$ $Y_{in}S3$ $C_{in}S1$ $C_{in}S2$ $C_{in}S3$	S_9-a , others-b / off S_{15}-a , others-b / off S_{21}-a , others-b / off S_{11}-a , others-b / off S_{17}-a , others-b / off S_{23}-a , others-b / off	11111011 11111010 11111001 11111011 11111010 11111001	Measure the amplitude in the same way using pin 36.

NOTE	ITEM		MEASURING CONDITIONS (UNLESS OTHERWISE SPECIFIED, V_{CC} = 9V, Ta = 25±3°C) SW & VR MODE SW MODE	DATA 2	MEASUREMENT METHOD
7-(3)	S Video Gain (Clamp Off) (Sub)	$Y_{in}S1$ $Y_{in}S2$ $Y_{in}S3$ $C_{in}S1$ $C_{in}S2$ $C_{in}S3$	S_9-a , S_{37}-on, others-b / off S_{15}-a , S_{37}-on, others-b / off S_{21}-a , S_{37}-on, others-b / off S_{11}-a , S_{37}-on, others-b / off S_{17}-a , S_{37}-on, others-b / off S_{23}-a , S_{37}-on, others-b / off	11111011 11111010 11111001 11111011 11111010 11111001	Measure the amplitude in the same way using pin 36.
7-(4)	S Video Gain (Clamp Off) (Main)	$Y_{in}S1$ $Y_{in}S2$ $Y_{in}S3$ $C_{in}S1$ $C_{in}S2$ $C_{in}S3$	S_9-a , S_{47}-on, others-b / off S_{15}-a , S_{47}-on, others-b / off S_{21}-a , S_{47}-on, others-b / off S_{11}-a , S_{47}-on, others-b / off S_{17}-a , S_{47}-on, others-b / off S_{23}-a , S_{47}-on, others-b / off	DATA 3 11111011 11111010 11111001 11111011 11111010 11111001	Measure the amplitude in the same way using pin 46.
8-(1)	B / W Mode Gain (Main)	$V_{in}E2$ $V_{in}E1$ $V_{in}S1$ $V_{in}S2$ $V_{in}S3$ $V_{in}E3$ $V_{in}E4$	S_2-a , others-b / off S_5-a , others-b / off S_{7A}-a , others-b / off S_{13A}-a , others-b / off S_{19A}-a , others-b / off S_{50}-a , others-b / off S_{53}-a , others-b / off	DATA 2 10100110 10100111 10100011 10100010 10100001 10100101 10100100	Measure the amplitude in the same way using pin 44.
		$V_{in}E2$ $V_{in}E1$ $V_{in}S1$ $V_{in}S2$ $V_{in}S3$ $V_{in}E3$ $V_{in}E4$	S_2-a , others-b / off S_5-a , others-b / off S_{7A}-a , others-b / off S_{13A}-a , others-b / off S_{19A}-a , others-b / off S_{50}-a , others-b / off S_{53}-a , others-b / off	10100110 10100111 10100011 10100010 10100001 10100101 10100100	Measure the amplitude in the same way using pin 42.

NOTE	ITEM		MEASURING CONDITIONS (UNLESS OTHERWISE SPECIFIED, V_{CC} = 9V, Ta = 25±3°C)		
			SW & VR MODE		MEASUREMENT METHOD
			SW MODE	DATA 3	
8-(2)	B / W Mode Gain (Sub)	$V_{in}E2$ $V_{in}E1$ $V_{in}S1$ $V_{in}S2$ $V_{in}S3$ $V_{in}E3$ $V_{in}E4$	S_2-a , others-b / off S_5-a , others-b / off S_{7A}-a , others-b / off S_{13A}-a , others-b / off S_{19A}-a , others-b / off S_{50}-a , others-b / off S_{53}-a , others-b / off	10100110 10100111 10100011 10100010 10100001 10100101 10100100	Measure the amplitude in the same way using pin 34.
		$V_{in}E2$ $V_{in}E1$ $V_{in}S1$ $V_{in}S2$ $V_{in}S3$ $V_{in}E3$ $V_{in}E4$	S_2-a , others-b / off S_5-a , others-b / off S_{7A}-a , others-b / off S_{13A}-a , others-b / off S_{19A}-a , others-b / off S_{50}-a , others-b / off S_{53}-a , others-b / off	10100110 10100111 10100011 10100010 10100001 10100101 10100100	Measure the amplitude in the same way using pin 32.

NOTE	ITEM		MEASURING CONDITIONS (UNLESS OTHERWISE SPECIFIED, V_{CC} = 9V, Ta = 25±3°C)		
			SW & VR MODE		MEASUREMENT METHOD
			SW MODE	DATA 2	
9-(1)	V Switch Crosstalk (Main)	$V_{in}E2$	All-b / off except those specified on the left	****0110	(1) V_1 3.58MHz, $1V_{p-p}$ input. (2) While sequentially switching S_2, S_5, S_{7A}, S_9, S_{11}, S_{13A}, S_{15}, S_{17}, S_{19A}, S_{21}, S_{23}, S_{30}, S_{38}, S_{40}, S_{48}, S_{50}, and S_{53} to 'a', measure the maximum level of crosstalk to pin 46 and find its ratio to output in selected mode.
		$V_{in}E1$	All-b / off except those specified on the left	****0111	
		$V_{in}S1$	All-b / off except those specified on the left	****0011	
		$V_{in}S2$	All-b / off except those specified on the left	****0010	
		$V_{in}S3$	All-b / off except those specified on the left	****0001	
		$V_{in}E3$	All-b / off except those specified on the left	****0101	
		$V_{in}E4$	All-b / off except those specified on the left	****0100	
		$Y_{in}S1$, $C_{in}S1$	All-b / off except those specified on the left	****1011	
		$Y_{in}S2$, $C_{in}S2$	All-b / off except those specified on the left	****1010	
		$Y_{in}S3$, $C_{in}S3$	All-b / off except those specified on the left	****1001	
9-(2)	V Switch Crosstalk (Sub)			DATA 3	(1) V_1 3.58MHz, $1V_{p-p}$ input. (2) While sequentially switching S_2, S_5, S_{7A}, S_9, S_{11}, S_{13A}, S_{15}, S_{17}, S_{19A}, S_{21}, S_{23}, S_{30}, S_{38}, S_{40}, S_{48}, S_{50}, and S_{53} to 'a', measure the maximum level of crosstalk to pin 36 and find its ratio to output in selected mode.
		$V_{in}E2$	All-b / off except those specified on the left	****0110	
		$V_{in}E1$	All-b / off except those specified on the left	****0111	
		$V_{in}S1$	All-b / off except those specified on the left	****0011	
		$V_{in}S2$	All-b / off except those specified on the left	****0010	
		$V_{in}S3$	All-b / off except those specified on the left	****0001	
		$V_{in}E3$	All-b / off except those specified on the left	****0101	
		$V_{in}E4$	All-b / off except those specified on the left	****0100	
		$Y_{in}S1$, $C_{in}S1$	All-b / off except those specified on the left	****1011	
		$_{in}S2$, $C_{in}S2$	All-b / off except those specified on the left	****1010	
		$Y_{in}S3$, $C_{in}S3$	All-b / off except those specified on the left	****1001	
10-(1)	Y Switch Crosstalk (Main)			DATA 2	Measure the maximum level of crosstalk in the same way using pin 44.
		$Y_{in}S1$	All-b / off except those specified on the left	11111011	
		$Y_{in}S2$	All-b / off except those specified on the left	11111010	
		$Y_{in}S3$	All-b / off except those specified on the left	11111001	
		$Y_{in}1$	All-b / off except those specified on the left	0101****	
		$V_{in}E3$	All-b / off except those specified on the left	0100****	
10-(2)	Y Switch Crosstalk (Sub)			DATA 3	Measure the maximum level of crosstalk in the same way using pin 34.
		$Y_{in}S1$	All-b / off except those specified on the left	11111011	
		$Y_{in}S2$	All-b / off except those specified on the left	11111010	
		$Y_{in}S3$	All-b / off except those specified on the left	11111001	
		$Y_{in}2$	All-b / off except those specified on the left	0101****	
		$V_{in}E3$	All-b / off except those specified on the left	0100****	

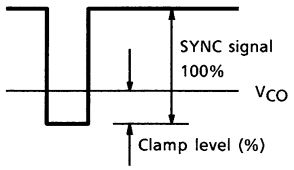
NOTE	ITEM		MEASURING CONDITIONS (UNLESS OTHERWISE SPECIFIED, V_{CC} = 9V, Ta = 25±3°C)		
			SW & VR MODE		MEASUREMENT METHOD
			SW MODE	DATA 2	
11-(1)	C Switch Crosstalk (Main)	$C_{in}S1$ $C_{in}S2$ $C_{in}S3$ $C_{in}1$	All-b / off except those specified on the left All-b / off except those specified on the lef tAll-b / off except those specified on the lef tAll-b / off except those specified on the left	11111011 11111010 11111001 0101****	Measure the maximum level of crosstalk in the same way using pin 42.
				DATA 3	
11-(2)	C Switch Crosstalk (Sub)	$C_{in}S1$ $C_{in}S2$ $C_{in}S3$ $C_{in}1$	All-b / off except those specified on the left All-b / off except those specified on the left All-b / off except those specified on the left All-b / off except those specified on the left	11111011 11111010 11111001 0101****	Measure the maximum level of crosstalk in the same way using pin 32.
				DATA 2	
12-(1)	V Switch Crosstalk (Clamp Off) (Main)	$V_{in}E2$ $V_{in}E1$ $V_{in}S1$ $V_{in}S2$ $V_{in}S3$ $V_{in}E3$ $V_{in}E4$ $Y_{in}S1$, $C_{in}S1$ $Y_{in}S2$, $C_{in}S2$ $Y_{in}S3$, $C_{in}S3$	All-b / off except those specified on the left All-b / off except those specified on the left All-b / off except those specified on the left All-b / off except those specified on the left All-b / off except those specified on the left All-b / off except those specified on the left All-b / off except those specified on the left All-b / off except those specified on the left All-b / off except those specified on the left All-b / off except those specified on the left	****0110 ****0111 ****0011 ****0010 ****0001 ****0101 ****0100 ****1011 ****1010 ****1001	(1) S_{47}-ON, V_3 = 0V. (2) Measure the maximum level of crosstalk in the same way using pin 46.
				DATA 3	
12-(2)	V Switch Crosstalk (Clamp Off) (Sub)	$V_{in}E2$ $V_{in}E1$ $V_{in}S1$ $V_{in}S2$ $V_{in}S3$ $V_{in}E3$ $V_{in}E4$ $Y_{in}S1$, $C_{in}S1$ $Y_{in}S2$, $C_{in}S2$ $Y_{in}S3$, $C_{in}S3$	All-b / off except those specified on the left All-b / off except those specified on the left All-b / off except those specified on the left All-b / off except those specified on the left All-b / off except those specified on the left All-b / off except those specified on the left All-b / off except those specified on the left All-b / off except those specified on the left All-b / off except those specified on the left All-b / off except those specified on the left	****0110 ****0111 ****0011 ****0010 ****0001 ****0101 ****0100 ****1011 ****1010 ****1001	(1) S_{37}-ON, V_3 = 0V. (2) Measure the maximum level of crosstalk in the same way using pin 36.

NOTE	ITEM		MEASURING CONDITIONS (UNLESS OTHERWISE SPECIFIED, V_{CC} = 9V, Ta = 25±3°C) SW & VR MODE SW MODE	DATA 2	MEASUREMENT METHOD
13	Mute Attenuation	V_{out}1 Output	All-b / off except those specified on the left	****0000	(1) V_1 3.58MHz, 1Vp-p input. (2) While sequentially switching S_2, S_5, S_{7A}, S_9, S_{11}, S_{13A}, S_{15}, S_{17}, S_{19A}, S_{21}, S_{23}, S_{30}, S_{38}, S_{40}, S_{48}, S_{50} and S_{53} to 'a', measure the maximum level of crosstalk to pin 46 and find its ratio to output in selected mode.
		Y_{out}1 Output	All-b / off except those specified on the left	00******	Measure the maximum level of crosstalk in the same way using pin 44.
		C_{out}1 Output	All-b / off except those specified on the left	00******	Measure the maximum level of crosstalk in the same way using pin 42.
		V_{out}2 Output	All-b / off except those specified on the left	DATA 3 ****0000	Measure the maximum level of crosstalk in the same way using pin 36.
		Y_{out}2 Output	All-b / off except those specified on the left	00******	Measure the maximum level of crosstalk in the same way using pin 34
		C_{out}2 Output	All-b / off except those specified on the left	00******	Measure the maximum level of crosstalk in the same way using pin 32.
		V_{out}1 Output (Clamp Off)	All-b / off except those specified on the left	DATA 2 ****0000	(1) S_{47}-ON, V_3 = 0V (2) Measure the maximum level of crosstalk in the same way using pin 46.
		V_{out}2 Output (Clamp Off)	All-b / off except those specified on the left	DATA 3 ****0000	(1) S_{47}-ON, V_3 = 0V (2) Measure the maximum level of crosstalk in the same way using pin 36.

NOTE	ITEM		MEASURING CONDITIONS (UNLESS OTHERWISE SPECIFIED, V_{CC} = 9V, Ta = 25±3°C) SW & VR MODE SW MODE	DATA 2	MEASUREMENT METHOD
14-(1)	Video Frequency Response (Main)	$V_{in}E2$ $V_{in}E1$ $V_{in}S1$ $V_{in}S2$ $V_{in}S3$ $V_{in}E3$ $V_{in}E4$	S_2-a , others-b / off S_5-a , others-b / off S_{7A}-a , others-b / off S_{13A}-a , others-b / off S_{19A}-a , others-b / off S_{50}-a , others-b / off S_{53}-a , others-b / off	****0110 ****0111 ****0011 ****0010 ****0001 ****0101 ****0100	(1) V_1 frequency-variable, $1V_{p-p}$ input. (2) For each, measure the output amplitude on pin 46 to find the frequency equivalent to −3dB.
14-(2)	Video Frequency Response (Sub)	$V_{in}E2$ $V_{in}E1$ $V_{in}S1$ $V_{in}S2$ $V_{in}S3$ $V_{in}E3$ $V_{in}E4$	S_2-a , others-b / off S_5-a , others-b / off S_{7A}-a , others-b / off S_{13A}-a , others-b / off S_{19A}-a , others-b / off S_{50}-a , others-b / off S_{53}-a , others-b / off	DATA 3 ****0110 ****0111 ****0011 ****0010 ****0001 ****0101 ****0100	(1) V_1 15kHz, $1V_{p-p}$ input. (2) For each, measure the output amplitude on pin 36 to find the frequency equivalent to −3dB.
14-(3)	Video Frequency Response (Clamp Off) (Main)	$V_{in}E2$ $V_{in}E1$ $V_{in}S1$ $V_{in}S2$ $V_{in}S3$ $V_{in}E3$ $V_{in}E4$	S_2-a , S_{47}-on, others-b / off S_5-a , S_{47}-on, others-b / off S_{7A}-a , S_{47}-on, others-b / off S_{13A}-a , S_{47}-on, others-b / off S_{19A}-a , S_{47}-on, others-b / off S_{50}-a , S_{47}-on, others-b / off S_{53}-a , S_{47}-on, others-b / off	DATA 2 ****0110 ****0111 ****0011 ****0010 ****0001 ****0101 ****0100	(1) V_1 frequency-variable, $1V_{p-p}$ input, V_3 = 0V. (2) For each, measure the output amplitude on pin 46 to find the frequency equivalent to −3dB.
14-(4)	Video Frequency Response (Clamp Off) (Sub)	$V_{in}E2$ $V_{in}E1$ $V_{in}S1$ $V_{in}S2$ $V_{in}S3$ $V_{in}E3$ $V_{in}E4$	S_2-a , S_{37}-on, others-b / off S_5-a , S_{37}-on, others-b / off S_{7A}-a , S_{37}-on, others-b / off S_{13A}-a , S_{37}-on, others-b / off S_{19A}-a , S_{37}-on, others-b / off S_{50}-a , S_{37}-on, others-b / off S_{53}-a , S_{37}-on, others-b / off	DATA 3 ****0110 ****0111 ****0011 ****0010 ****0001 ****0101 ****0100	(1) V_1 frequency-variable, $1V_{p-p}$ input, V_3 = 0V. (2) For each, measure the output amplitude on pin 36 to find the frequency equivalent to −3dB.

NOTE	ITEM		MEASURING CONDITIONS (UNLESS OTHERWISE SPECIFIED, V_{CC} = 9V, Ta = 25±3°C) SW & VR MODE SW MODE	DATA 2	MEASUREMENT METHOD
15-(1)	Y / C Frequency Response (Main)	$Y_{in}S1$ $Y_{in}S2$ $Y_{in}S3$	S_9-a , others-b / off S_{15}-a , others-b / off S_{21}-a , others-b / off S_{48}-a , others-b / off S_{50}-a , others-b / off	11111011 11111010 11111001 0101**** 0100****	Measure the amplitude in the same way using pin 44.
		$Y_{in}1$ $V_{in}E3$			
		$C_{in}S1$ $C_{in}S2$ $C_{in}S3$	S_{11}-a , others-b / off S_{17}-a , others-b / off S_{23}-a , others-b / off S_{40}-a , others-b / off	11111011 11111010 11111001 0101****	Measure the amplitude in the same way using pin 42.
		$C_{in}1$			
15-(2)	Y / C Frequency Response (Sub)			DATA 3	
		$Y_{in}S1$ $Y_{in}S2$ $Y_{in}S3$	S_9-a , others-b / off S_{15}-a , others-b / off S_{21}-a , others-b / off S_{38}-a , others-b / off S_{53}-a , others-b / off	11111011 11111010 11111001 0101**** 0100****	Measure the amplitude in the same way using pin 34
		$Y_{in}2$ $V_{in}E4$			
		$C_{in}S1$ $C_{in}S2$ $C_{in}S3$	S_{11}-a , others-b / off S_{17}-a , others-b / off S_{23}-a , others-b / off S_{30}-a , others-b / off	11111011 11111010 11111001 0101****	Measure the amplitude in the same way using pin 32.
		$C_{in}2$			
16-(1)	S Video Frequency Response (Main)			DATA 2	
		$Y_{in}S1$ $Y_{in}S2$ $Y_{in}S3$ $C_{in}S1$ $C_{in}S2$ $C_{in}S3$	S_9-a , others-b / off S_{15}-a , others-b / off S_{21}-a , others-b / off S_{11}-a , others-b / off S_{17}-a , others-b / off S_{23}-a , others-b / off	11111011 11111010 11111001 11111011 11111010 11111001	Measure the amplitude in the same way using pin 46.
16-(2)	S Video Frequency Response (Sub)			DATA 3	
		$Y_{in}S1$ $Y_{in}S2$ $Y_{in}S3$ $C_{in}S1$ $C_{in}S2$ $C_{in}S3$	S_9-a , others-b / off S_{15}-a , others-b / off S_{21}-a , others-b / off S_{11}-a , others-b / off S_{17}-a , others-b / off S_{23}-a , others-b / off	11111011 11111010 11111001 11111011 11111010 11111001	Measure the amplitude in the same way using pin 36.

NOTE	ITEM		MEASURING CONDITIONS (UNLESS OTHERWISE SPECIFIED, V_{CC} = 9V, Ta = 25±3°C) SW & VR MODE SW MODE	DATA 2	MEASUREMENT METHOD
16-(3)	S Video Frequency Response (Clamp Off) (Main)	$Y_{in}S1$ $Y_{in}S2$ $Y_{in}S3$ $C_{in}S1$ $C_{in}S2$ $C_{in}S3$	S_9-a , S_{47}-on, others-b / off S_{15}-a , S_{47}-on, others-b / off S_{21}-a , S_{47}-on, others-b / off S_{11}-a , S_{47}-on, others-b / off S_{17}-a , S_{47}-on, others-b / off S_{23}-a , S_{47}-on, others-b / off	11111011 11111010 11111001 11111011 11111010 11111001	Measure the amplitude in the same way using pin 46.
16-(4)	S Video Frequency Response (Clamp Off) (Sub)	$Y_{in}S1$ $Y_{in}S2$ $Y_{in}S3$ $C_{in}S1$ $C_{in}S2$ $C_{in}S3$	S_9-a , S_{37}-on, others-b / off S_{15}-a , S_{37}-on, others-b / off S_{21}-a , S_{37}-on, others-b / off S_{11}-a , S_{37}-on, others-b / off S_{17}-a , S_{37}-on, others-b / off S_{23}-a , S_{37}-on, others-b / off	DATA 3 11111011 11111010 11111001 11111011 11111010 11111001	Measure the amplitude in the same way using pin 36.
17-(1)	B / W Mode Frequency Response (Main)	$V_{in}E2$ $V_{in}E1$ $V_{in}S1$ $V_{in}S2$ $V_{in}S3$ $V_{in}E3$ $V_{in}E4$	S_2-a , others-b / off S_5-a , others-b / off S_{7A}-a , others-b / off S_{13A}-a , others-b / off S_{19A}-a , others-b / off S_{50}-a , others-b / off S_{53}-a , others-b / off	DATA 2 10100110 10100111 10100011 10100010 10100001 10100101 10100100	Measure the amplitude in the same way using pin 44.
		$V_{in}E2$ $V_{in}E1$ $V_{in}S1$ $V_{in}S2$ $V_{in}S3$ $V_{in}E3$ $V_{in}E4$	S_2-a , others-b / off S_5-a , others-b / off S_{7A}-a , others-b / off S_{13A}-a , others-b / off S_{19A}-a , others-b / off S_{50}-a , others-b / off S_{53}-a , others-b / off	10100110 10100111 10100011 10100010 10100001 10100101 10100100	Measure the amplitude in the same way using pin 42.

NOTE	ITEM		MEASURING CONDITIONS (UNLESS OTHERWISE SPECIFIED, V_{CC} = 9V, Ta = 25±3°C) SW & VR MODE SW MODE	DATA 3	MEASUREMENT METHOD
17-(2)	B / W Mode Frequency Response (Sub)	$V_{in}E2$ $V_{in}E1$ $V_{in}S1$ $V_{in}S2$ $V_{in}S3$ $V_{in}E3$ $V_{in}E4$	S_2-a , others-b / off S_5-a , others-b / off S_{7A}-a , others-b / off S_{13A}-a , others-b / off S_{19A}-a , others-b / off S_{50}-a , others-b / off S_{53}-a , others-b / off	10100110 10100111 10100011 10100010 10100001 10100101 10100100	Measure the amplitude in the same way using pin 34.
		$V_{in}E2$ $V_{in}E1$ $V_{in}S1$ $V_{in}S2$ $V_{in}S3$ $V_{in}E3$ $V_{in}E4$	S_2-a , others-b / off S_5-a , others-b / off S_{7A}-a , others-b / off S_{13A}-a , others-b / off S_{19A}-a , others-b / off S_{50}-a , others-b / off S_{53}-a , others-b / off	10100110 10100111 10100011 10100010 10100001 10100101 10100100	Measure the amplitude in the same way using pin 32.
18	Clamp Level	$V_{out}1$ Output	S_2-a , others-b / off	DATA 2 ****0110	(1) Measure the voltage V_{CO} on pin 46 during no-signal intervals. (2) Input a V_1 NTSC signal. (3) Observe the waveform on pin 46 and find the V_{CO} level from the sync tip in percentage assuming that the SYNC signal level = 100% 
		$V_{out}2$ Output	S_2-a, others-b / off	DATA 3 ****0110	Measure the V_{CO} level in the same way using pin 36.

NOTE	ITEM		MEASURING CONDITIONS (UNLESS OTHERWISE SPECIFIED, V_{CC} = 9V, Ta = 25±3°C)		
			SW & VR MODE		MEASUREMENT METHOD
			SW MODE	DATA 2	
19	Audio L Dynamic Range	$L_{in}E2$	S_1-a , others-b / off	****0110	(1) V_2 1kHz, amplitude-variable input. (2) For each, measure the amplitude of V_1 at which the waveform on pin 45 is distorted. (Data 1 D_{00} = 0 : mute off)
		$L_{in}E1$	S_4-a , others-b / off	****0111	
		$L_{in}S1$	S_8-a , others-b / off	****0011	
		$L_{in}S2$	S_{14}-a , others-b / off	****0010	
		$L_{in}S3$	S_{20}-a , others-b / off	****0001	
		$L_{in}E3$	S_{51}-a , others-b / off	****0101	
		$L_{in}E4$	S_{54A}-a , others-b / off	****0100	
				DATA 3	
		$L_{in}E2$	S_1-a , others-b / off	****0110	Measure the amplitude in the same way using pin 35. (Data 1 D_{01} = 0 : mute off)
		$L_{in}E1$	S_4-a , others-b / off	****0111	
		$L_{in}S1$	S_8-a , others-b / off	****0011	
		$L_{in}S2$	S_{14}-a , others-b / off	****0010	
		$L_{in}S3$	S_{20}-a , others-b / off	****0001	
		$L_{in}E3$	S_{51}-a , others-b / off	****0101	
		$L_{in}E4$	S_{54A}-a , others-b / off	****0100	
				DATA 2, 3	Measure the amplitude in the same way using pin 41. (Data 1 D_{02} = 0 : mute off)
		$L_{in}E1$	S_4-a , others-b / off	********	

NOTE	ITEM		MEASURING CONDITIONS (UNLESS OTHERWISE SPECIFIED, V_{CC} = 9V, Ta = 25±3°C)		
			SW & VR MODE		MEASUREMENT METHOD
			SW MODE	DATA 2	
19	Audio R Dynamic Range	$R_{in}E2$ $R_{in}E1$ $R_{in}S1$ $R_{in}S2$ $R_{in}S3$ $R_{in}E3$ $R_{in}E4$	S_3-a , others-b / off S_6-a , others-b / off S_{10}-a , others-b / off S_{16}-a , others-b / off S_{22}-a , others-b / off S_{49}-a , others-b / off S_{52A}-a , others-b / off	****0110 ****0111 ****0011 ****0010 ****0001 ****0101 ****0100	Measure the amplitude in the same way using pin 43. (Data 1 D_{00} = 0 : mute off)
				DATA 3	
		$R_{in}E2$ $R_{in}E1$ $R_{in}S1$ $R_{in}S2$ $R_{in}S3$ $R_{in}E3$ $R_{in}E4$	S_3-a , others-b / off S_6-a , others-b / off S_{10}-a , others-b / off S_{16}-a , others-b / off S_{22}-a , others-b / off S_{49}-a , others-b / off S_{52A}-a , others-b / off	****0110 ****0111 ****0011 ****0010 ****0001 ****0101 ****0100	Measure the amplitude in the same way using pin 33. (Data 1 D_{01} = 0 : mute off)
				DATA 2, 3	Measure the amplitude in the same way using pin 39. (Data 1 D_{02} = 0 : mute off)
		$R_{in}E1$	S_6-a , others-b / off	********	

NOTE	ITEM		MEASURING CONDITIONS (UNLESS OTHERWISE SPECIFIED, V_{CC} = 9V, Ta = 25±3°C)		
			SW & VR MODE		MEASUREMENT METHOD
			SW MODE	DATA 2	
20	Audio L Gain	$L_{in}E2$	S_1-a , others-b / off	****0110	(1) V_2 1kHz, $1V_{p-p}$ input. (2) For each, measure the output amplitude on pin 45 to find the gain. (Data 1 D_{00} = 0 : mute off)
		$L_{in}E1$	S_4-a , others-b / off	****0111	
		$L_{in}S1$	S_8-a , others-b / off	****0011	
		$L_{in}S2$	S_{14}-a , others-b / off	****0010	
		$L_{in}S3$	S_{20}-a , others-b / off	****0001	
		$L_{in}E3$	S_{51}-a , others-b / off	****0101	
		$L_{in}E4$	S_{54A}-a , others-b / off	****0100	
				DATA 3	
		$L_{in}E2$	S_1-a , others-b / off	****0110	Find the gain in the same way using pin 35. (Data 1 D_{01} = 0 : mute off)
		$L_{in}E1$	S_4-a , others-b / off	****0111	
		$L_{in}S1$	S_8-a , others-b / off	****0011	
		$L_{in}S2$	S_{14}-a , others-b / off	****0010	
		$L_{in}S3$	S_{20}-a , others-b / off	****0001	
		$L_{in}E3$	S_{51}-a , others-b / off	****0101	
		$L_{in}E4$	S_{54A}-a , others-b / off	****0100	
				DATA 2, 3	Find the gain in the same way using pin 41. (Data 1 D_{02} = 0 : mute off)
		$L_{in}E1$	S_4-a, others-b / off	********	

NOTE	ITEM		MEASURING CONDITIONS (UNLESS OTHERWISE SPECIFIED, V_{CC} = 9V, Ta = 25±3°C)		
			SW & VR MODE		MEASUREMENT METHOD
			SW MODE	DATA 2	
20	Audio R Gain	$R_{in}E2$	S_3-a , others-b / off	****0110	Find the gain in the same way using pin 43. (Data 1 D_{00} = 0 : mute off)
		$R_{in}E1$	S_6-a , others-b / off	****0111	
		$R_{in}S1$	S_{10}-a , others-b / off	****0011	
		$R_{in}S2$	S_{16}-a , others-b / off	****0010	
		$R_{in}S3$	S_{22}-a , others-b / off	****0001	
		$R_{in}E3$	S_{49}-a , others-b / off	****0101	
		$R_{in}E4$	S_{52A}-a , others-b / off	****0100	
				DATA 3	
		$R_{in}E2$	S_3-a , others-b / off	****0110	Find the gain in the same way using pin 33. (Data 1 D_{01} = 0 : mute off)
		$R_{in}E1$	S_6-a , others-b / off	****0111	
		$R_{in}S1$	S_{10}-a , others-b / off	****0011	
		$R_{in}S2$	S_{16}-a , others-b / off	****0010	
		$R_{in}S3$	S_{22}-a , others-b / off	****0001	
		$R_{in}E3$	S_{49}-a , others-b / off	****0101	
		$R_{in}E4$	S_{52A}-a , others-b / off	****0100	
				DATA 2, 3	Find the gain in the same way using pin 39. (Data 1 D02 = 0 : mute off)
		$R_{in}E1$	S_6-a , others-b / off	********	

NOTE	ITEM		MEASURING CONDITIONS (UNLESS OTHERWISE SPECIFIED, V_{CC} = 9V, Ta = 25±3°C)		
			SW & VR MODE		MEASUREMENT METHOD
			SW MODE	DATA 2	
21	Audio L Frequency Response	$L_{in}E2$	S_1-a , others-b / off	****0110	(1) V_2 frequency-variable, $1V_{p-p}$ input. (2) Measure the output amplitude on pin 45 and find the frequency equivalent to −3dB. (Data 1 D_{00} = 0 : mute off)
		$L_{in}E1$	S_4-a , others-b / off	****0111	
		$L_{in}S1$	S_8-a , others-b / off	****0011	
		$L_{in}S2$	S_{14}-a , others-b / off	****0010	
		$L_{in}S3$	S_{20}-a , others-b / off	****0001	
		$L_{in}E3$	S_{51}-a , others-b / off	****0101	
		$L_{in}E4$	S_{54A}-a , others-b / off	****0100	
				DATA 3	
		$L_{in}E2$	S_1-a , others-b / off	****0110	Measure the amplitude in the same way using pin 35. (Data 1 D_{01} = 0 : mute off)
		$L_{in}E1$	S_4-a , others-b / off	****0111	
		$L_{in}S1$	S_8-a , others-b / off	****0011	
		$L_{in}S2$	S_{14}-a , others-b / off	****0010	
		$L_{in}S3$	S_{20}-a , others-b / off	****0001	
		$L_{in}E3$	S_{51}-a , others-b / off	****0101	
		$L_{in}E4$	S_{54A}-a , others-b / off	****0100	
				DATA 2, 3	Measure the amplitude in the same way using pin 41. (Data 1 D_{02} = 0 : mute off)
		$L_{in}E1$	S_4-a , others-b / off	********	

NOTE	ITEM		MEASURING CONDITIONS (UNLESS OTHERWISE SPECIFIED, V_{CC} = 9V, Ta = 25±3°C)		
			SW & VR MODE		MEASUREMENT METHOD
			SW MODE	DATA 2	
21	Audio R Frequency Response	$R_{in}E2$	S_3-a , others-b / off	****0110	Measure the amplitude in the same way using pin 43. (Data 1 D_{00} = 0 : mute off)
		$R_{in}E1$	S_6-a , others-b / off	****0111	
		$R_{in}S1$	S_{10}-a , others-b / off	****0011	
		$R_{in}S2$	S_{16}-a , others-b / off	****0010	
		$R_{in}S3$	S_{22}-a , others-b / off	****0001	
		$R_{in}E3$	S_{49}-a , others-b / off	****0101	
		$R_{in}E4$	S_{52A}-a , others-b / off	****0100	
				DATA 3	
		$R_{in}E2$	S_3-a , others-b / off	****0110	Measure the amplitude in the same way using pin 33. (Data 1 D_{01} = 0 : mute off)
		$R_{in}E1$	S_6-a , others-b / off	****0111	
		$R_{in}S1$	S_{10}-a , others-b / off	****0011	
		$R_{in}S2$	S_{16}-a , others-b / off	****0010	
		$R_{in}S3$	S_{22}-a , others-b / off	****0001	
		$R_{in}E3$	S_{49}-a , others-b / off	****0101	
		$R_{in}E4$	S_{52A}-a , others-b / off	****0100	
				DATA 2, 3	Measure the amplitude in the same way using pin 39. (Data 1 D_{02} = 0 : mute off)
		$R_{in}E1$	S_4-a , others-b / off	********	

NOTE	ITEM		MEASURING CONDITIONS (UNLESS OTHERWISE SPECIFIED, V_{CC} = 9V, Ta = 25±3°C)		
			SW & VR MODE		MEASUREMENT METHOD
			SW MODE	DATA 2	
22	L Switch Crosstalk	$L_{in}E2$	All-b / off except those specified on the left	****0110	(1) V_2 1kHz, 1Vp-p input. (2) While sequentially switching S_1, S_3, S_4, S_6, S_{10}, S_{14}, S_{16}, S_{20}, S_{22}, S_{49}, S_{51}, S_{52A}, and S_{54A} to 'a', measure the maximum level of crosstalk to pin 45 and find its ratio to selected output. (Data 1 D_{00} = 0 : mute off)
		$L_{in}E1$	All-b / off except those specified on the left	****0111	
		$L_{in}S1$	All-b / off except those specified on the left	****0011	
		$L_{in}S2$	All-b / off except those specified on the left	****0010	
		$L_{in}S3$	All-b / off except those specified on the left	****0001	
		$L_{in}E3$	All-b / off except those specified on the left	****0101	
		$L_{in}E4$	All-b / off except those specified on the left	****0100	
				DATA 3	
		$L_{in}E2$	All-b / off except those specified on the left	****0110	Measure the amplitude in the same way using pin 35. (Data 1 D_{01} = 0 : mute off)
		$L_{in}E1$	All-b / off except those specified on the left	****0111	
		$L_{in}S1$	All-b / off except those specified on the left	****0011	
		$L_{in}S2$	All-b / off except those specified on the left	****0010	
		$L_{in}S3$	All-b / off except those specified on the left	****0001	
		$L_{in}E3$	All-b / off except those specified on the left	****0101	
		$L_{in}E4$	All-b / off except those specified on the left	****0100	

NOTE	ITEM		MEASURING CONDITIONS (UNLESS OTHERWISE SPECIFIED, V_{CC} = 9V, Ta = 25±3°C) SW & VR MODE SW MODE	DATA 2	MEASUREMENT METHOD
22	R Switch Crosstalk	$R_{in}E2$	All-b / off except those specified on the left	****0110	Measure the maximum level of crosstalk in the same way using pin 43. (Data 1 D_{00} = 0 : mute off)
		$R_{in}E1$	All-b / off except those specified on the left	****0111	
		$R_{in}S1$	All-b / off except those specified on the left	****0011	
		$R_{in}S2$	All-b / off except those specified on the left	****0010	
		$R_{in}S3$	All-b / off except those specified on the left	****0001	
		$R_{in}E3$	All-b / off except those specified on the left	****0101	
		$R_{in}E4$	All-b / off except those specified on the left	****0100	
				DATA 3	Measure the maximum level of crosstalk in the same way using pin 33. (Data 1 D_{01} = 0 : mute off)
		$R_{in}E2$	All-b / off except those specified on the left	****0110	
		$R_{in}E1$	All-b / off except those specified on the left	****0111	
		$R_{in}S1$	All-b / off except those specified on the left	****0011	
		$R_{in}S2$	All-b / off except those specified on the left	****0010	
		$R_{in}S3$	All-b / off except those specified on the left	****0001	
		$R_{in}E3$	All-b / off except those specified on the left	****0101	
		$R_{in}E4$	All-b / off except those specified on the left	****0100	
	TV-L Crosstalk		All-b / off except those specified on the left	DATA 2, 3	Measure the maximum level of crosstalk in the same way using pin 41. (Data 1 D_{02} = 0 : mute off)
				********	
	TV-R Crosstalk		All-b / off except those specified on the left	********	Measure the maximum level of crosstalk in the same way using pin 39. (Data 1 D_{02} = 0 : mute off)

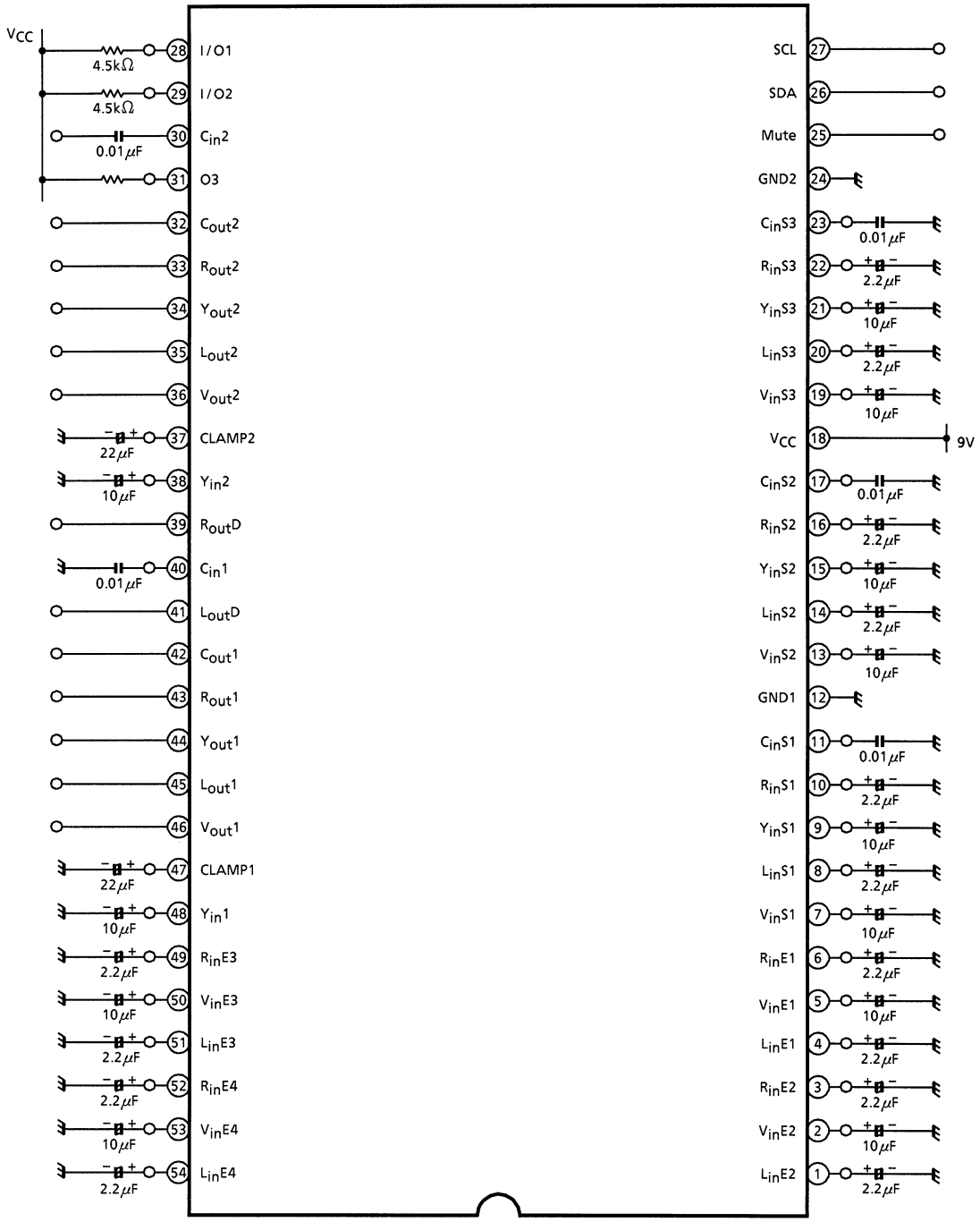
NOTE	ITEM	MEASURING CONDITIONS (UNLESS OTHERWISE SPECIFIED, V_{CC} = 9V, Ta = 25±3°C)		
		SW & VR MODE		MEASUREMENT METHOD
		SW MODE	DATA 2, 3	
23	L Switch Mute Attenuation	All-b / off except those specified on the left	********	(1) V_2 1kHz, $1V_{p-p}$ input. (2) Mute on (data 1 D_{00} = 1) and while sequentially switching S_1, S_3, S_4, S_6, S_8, S_{10}, S_{14}, S_{16}, S_{20}, S_{22}, S_{49}, S_{51}, S_{52A}, and S_{54A} to 'a', measure the maximum level of crosstalk to pin 45 and find its ratio to selected output.
		All-b / off except those specified on the left	********	Measure the maximum level of crosstalk in the same way using pin 35. (Data 1 D_{01} = 1 : mute on)
	R Switch Mute Attenuation	All-b / off except those specified on the left	********	Measure the maximum level of crosstalk in the same way using pin 43. (Data 1 D_{00} = 1 : mute on)
		All-b / off except those specified on the left	********	Measure the maximum level of crosstalk in the same way using pin 33. (Data 1 D_{01} = 1 : mute on)

NOTE	ITEM		MEASURING CONDITIONS (UNLESS OTHERWISE SPECIFIED, V_{CC} = 9V, Ta = 25±3°C)		
			SW & VR MODE		MEASUREMENT METHOD
			SW MODE	DATA 2, 3	
24	Mode Switching Offset	$L_{in}E2$ $L_{in}E1$ $L_{in}S1$ $L_{in}S2$ $L_{in}S3$ $L_{in}E3$ $L_{in}E4$	All-b / off All-b / off All-b / off All-b / off All-b / off All-b / off All-b / off	****0110 ****0111 ****0011 ****0010 ****0001 ****0101 ****0100	(1) No-signal input. (2) Measure voltage fluctuations to find the maximum value in all input modes of data 2 for pin 45, and in all input modes of data 3 for pin 35.
		$R_{in}E2$ $R_{in}E1$ $R_{in}S1$ $R_{in}S2$ $R_{in}S3$ $R_{in}E3$ $R_{in}E4$	All-b / off All-b / off All-b / off All-b / off All-b / off All-b / off All-b / off	****0110 ****0111 ****0011 ****0010 ****0001 ****0101 ****0100	Find the maximum value in the same way using pin 43 (data 2) and pin 33 (data 3).
		$L_{in}E1$	All-b / off	********	Find the maximum value in the same way using pin 41.
		$R_{in}E1$	All-b / off	********	Find the maximum value in the same way using pin 39

NOTE	ITEM		MEASURING CONDITIONS (UNLESS OTHERWISE SPECIFIED, V_{CC} = 9V, Ta = 25±3°C) SW & VR MODE SW MODE	DATA 2, 3	MEASUREMENT METHOD
25	S Input Discriminating Voltage	$V_{in}S1$	S_9-a, S_{7B}-on, others-b / off	****0011	(1) V_1 1kHz, 1V_{p-p} input. (2) While gradually lowering the V_3 voltage, find the voltage where the output mode changes to the S mode (i.e., the voltage at which a waveform appears on pin 46). (Data 1 D_{00}, D_{01}, D_{02} = 0 : mute off)
		$V_{in}S2$	S_{15}-a, S_{13B}-on, others-b / off	****0010	
		$V_{in}S3$	S_{21}-a, S_{19B}-on, others-b / off	****0001	
26	I Input Discriminating Voltage	I / O1	S_{28}-a , others-b / off	********	While gradually lowering the V_3 voltage, find the voltage at which the data of B34, B35, B36, and B37 changes from 0 to 1, respectively. (Data 1 D_{03}, D_{04} = 1 : I MODE)
		I / O2	S_{29}-a , others-b / off	********	
		$R_{in}E4$	S_{52B}-on , others-b / off	********	
		$L_{in}E4$	S_{54B}-on , others-b / off	********	
27	External Mute-ON Voltage	Mute	S_4, S_{25}-a, others-b / off	********	While gradually raising the V_3 voltage, find the voltage at which mute is turned on.
28	O Output Low Level Voltage	I / O1	All-b / off	********	Find the voltage on pins 28, 29, and 31 when the data D_{03}, D_{04}, and D_{05} are 0, respectively.
		I / O2	All-b / off	********	
		O3	All-b / off	********	

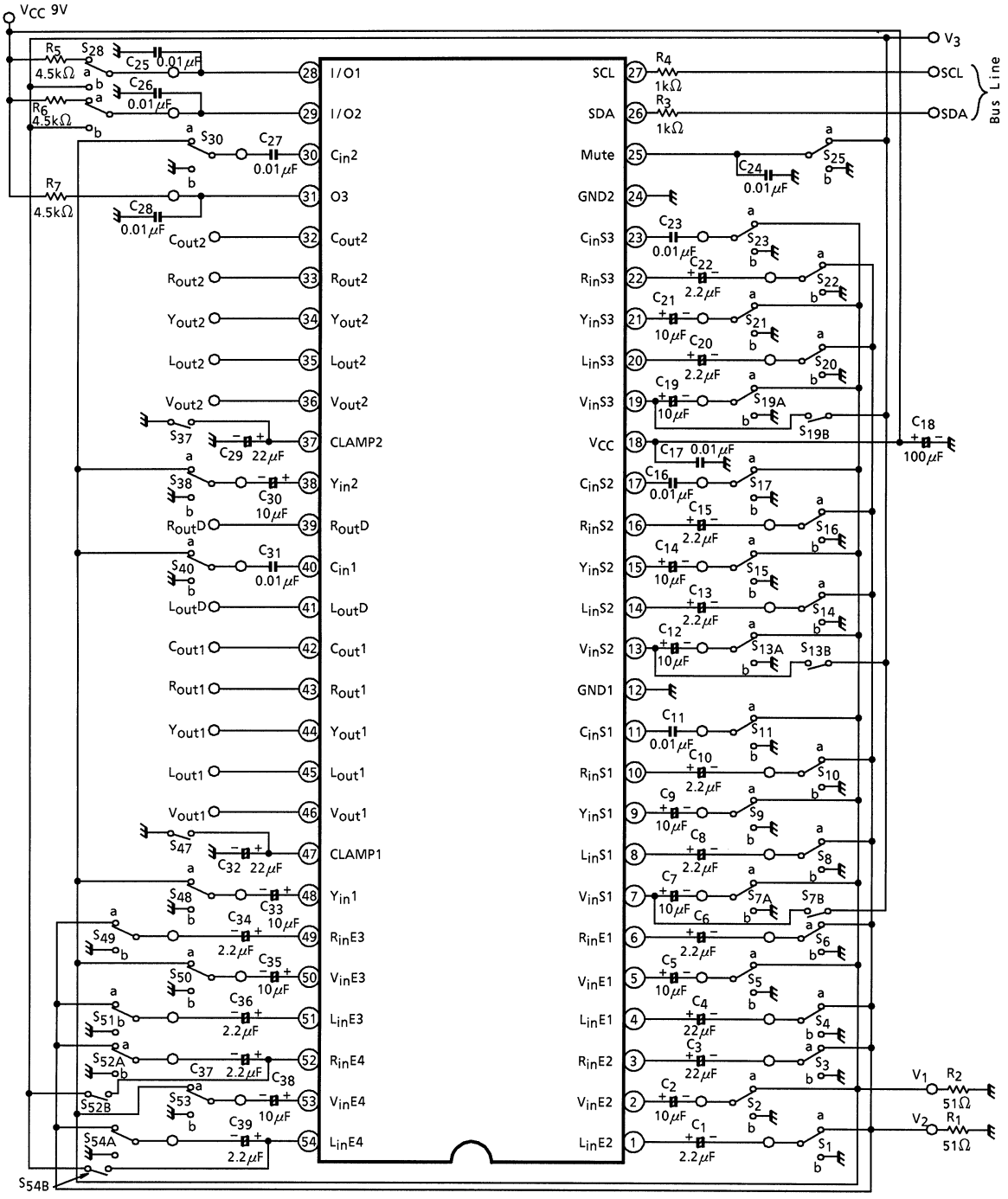
TEST CIRCUIT 1

DC characteristics



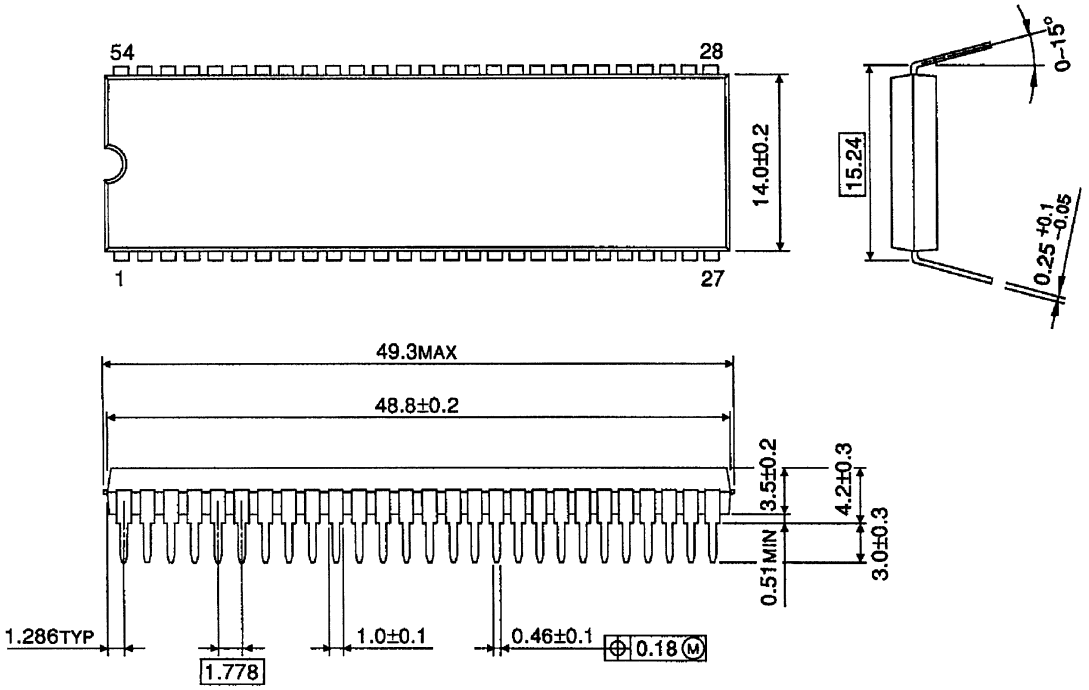
TEST CIRCUIT 2

AC characteristics



PACKAGE DIMENSIONS

SDIP54-P-600-1.78 Unit : mm



Weight: 5.44 g (Typ.)

About solderability, following conditions were confirmed

- Solderability

  (1) Use of Sn-63Pb solder Bath
  - solder bath temperature = 230°C
  - dipping time = 5 seconds
  - the number of times = once
  - use of R-type flux

  (2) Use of Sn-3.0Ag-0.5Cu solder Bath
  - solder bath temperature = 245°C
  - dipping time = 5 seconds
  - the number of times = once
  - use of R-type flux

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