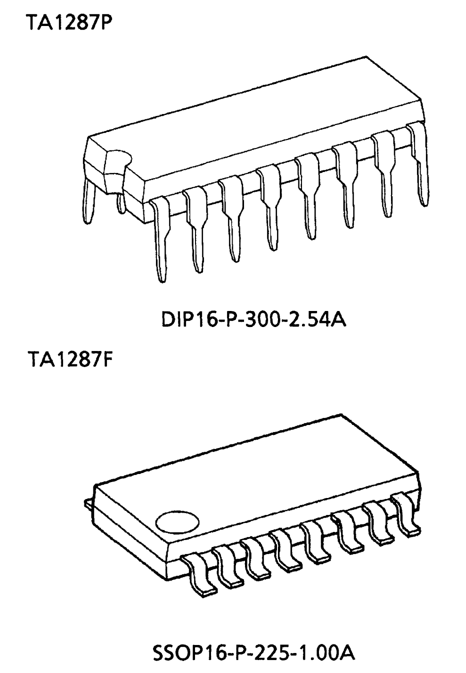
TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA1287P,TA1287F

RGB TO YUV / IQ HIGH-SPEED MATRIX IC

TA1287P, TA1287F are a high-speed switching IC which have 2-channel inputs circuit and a RGB to YUV / IQ matrix circuit. Another feature, TA1287P, TA1287F have a signals mixing circuit, which are enable to mix a main signal with an external input signal and outputs the mixed signal. The mixing circuit has 8 combinations of mixing gain ratio of a main to an external signals, which is controlled by high-speed switch.

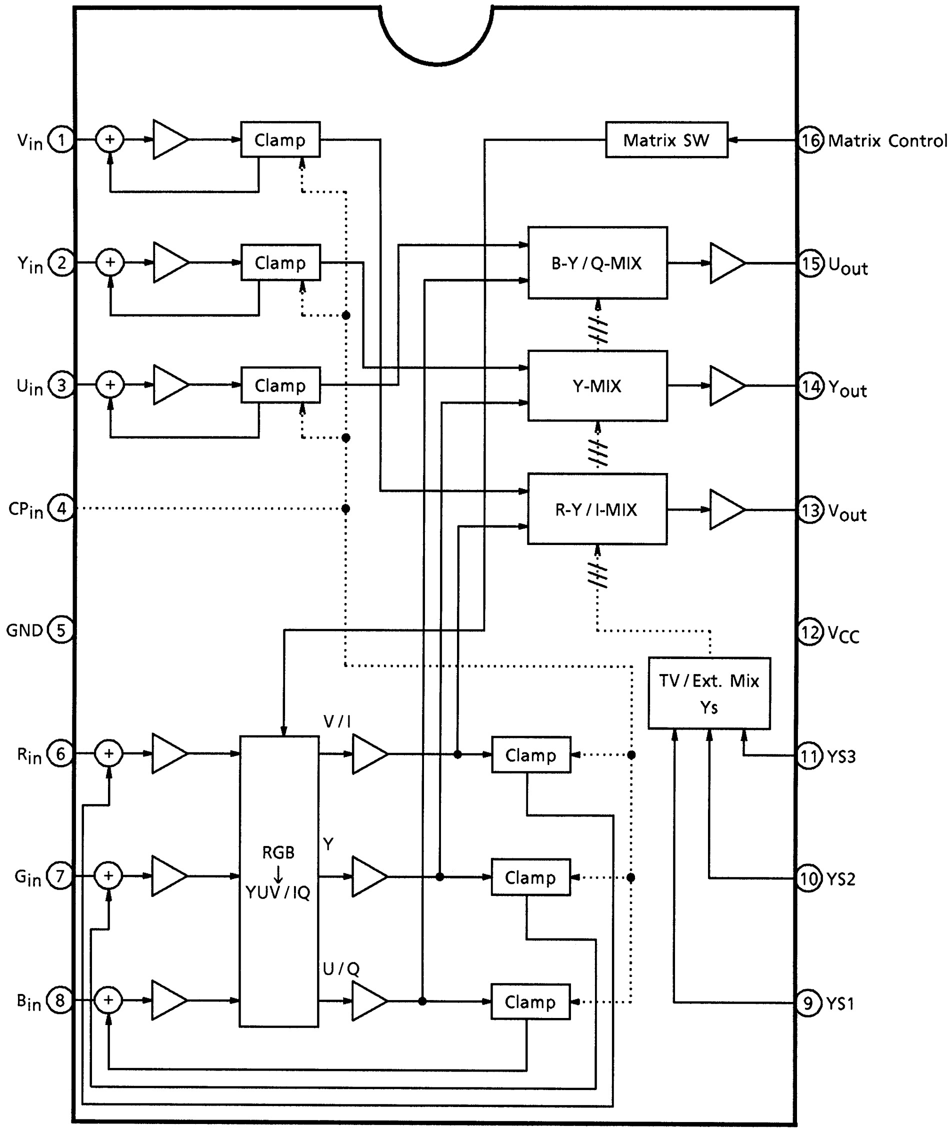


Weight
DIP16-P-300-2.54A : 1.0 g (Typ.)
SSOP16-P-225-1.00A : 0.14 g (Typ.)

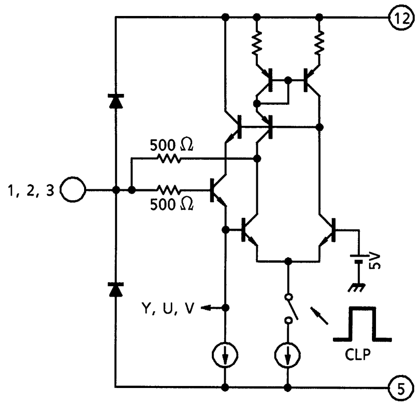
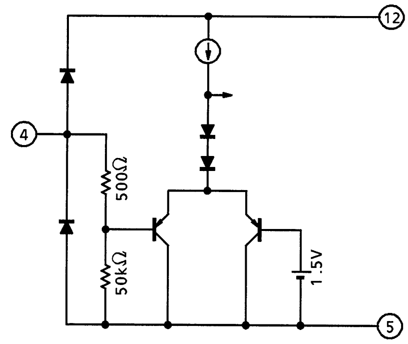
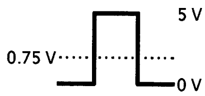
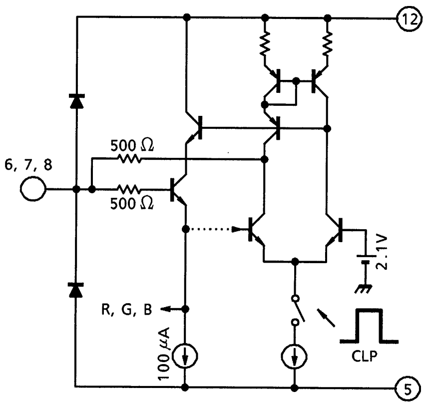
FEATURES

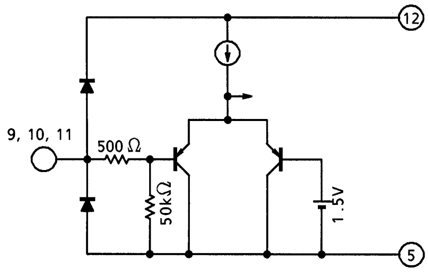
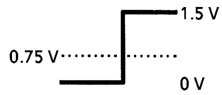
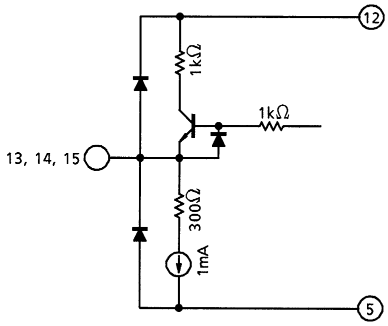
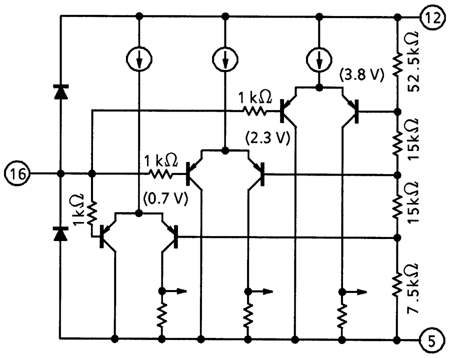
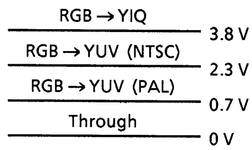
- RGB to YUV / IQ matrix circuit
- The mixing circuit for a main signal and an external signal
- The high-speed switching circuit of a main signal an external signal
- Band Width : 30MHz at −3dB point.

BLOCK DIAGRAM



TERMINAL FUNCTIONS

<table>
<tr><th>PIN No.</th><th>PIN NAME</th><th>FUNCTION</th><th>INTERFACE CIRCUIT</th><th>INPUT / OUTPUT SIGNAL</th></tr>
<tr><td>1</td><td>V_{IN}</td><td>Input R-Y (V) or R signal through a clamping capacitor.</td><td rowspan="3"></td><td rowspan="3">DC : 6.2 V
Y : 1 V_{p-p} (with sync)
U / V : 0.3 V_{p-p}
(B : C = 1 : 1)
R / G / B
: 0.7 V_{p-p}
(100% white)</td></tr>
<tr><td>2</td><td>Y_{IN}</td><td>Input Y or G signal through a clamping capacitor.</td></tr>
<tr><td>3</td><td>U_{IN}</td><td>Input B-Y (U) or B signal through a clamping capacitor.</td></tr>
<tr><td>4</td><td>CP_{IN}</td><td>Input clamping pulse.
Threshold : 0.75 V</td><td></td><td></td></tr>
<tr><td>5</td><td>GND</td><td>GND.</td><td>—</td><td>—</td></tr>
<tr><td>6</td><td>R_{IN}</td><td>Input R or R-Y (V) signal through clamping capacitor.</td><td rowspan="3"></td><td rowspan="3">DC : 6.2 V
Y : 1V $_{p-p}$ (with sync)
U / V : 0.3 V_{p-p}
(B : C = 1 : 1)
R / G / B
: 0.7 V_{p-p}
(100% white)</td></tr>
<tr><td>7</td><td>G_{IN}</td><td>Input G or Y signal through a clamping capacitor.</td></tr>
<tr><td>8</td><td>B_{IN}</td><td>Input B or B-Y (U) signal through a clamping capacitor.</td></tr>
</table>

PIN No	PIN NAME	FUNCTION	INTERFACE CIRCUIT	INPUT / OUTPUT SIGNAL
9 10 11	YS1,2, 3	Selector to switch mixing ratios. Threshold : 0.75 V		
12	V_{CC}	Supply 9 V.	—	DC : 9 V
13	V_{OUT}	Outputs R-Y (V) or R signal.		DC : 4.7 V Y : 1 V_{p-p} (with sync) U / V : 0.3 V_{p-p} (B : C = 1 : 1) R / G / B : 0.7 V_{p-p} (100% color bar)
14	Y_{OUT}	Outputs Y or G signal.		
15	U_{OUT}	Outputs B-Y (U) or B signal.		
16	Matrix Control	This terminal's voltage control the matrix coefficient for output signals.Selects the output mode.		

FUNCTION DESCRIPTION

MIXING RATIO

TA1287P, TA1287F have a circuit, which mixes a main signal with an external input signal and outputs the mixed signal. The mixing circuit has 8 combinations of mixing gain ratio of a main to an external signals.

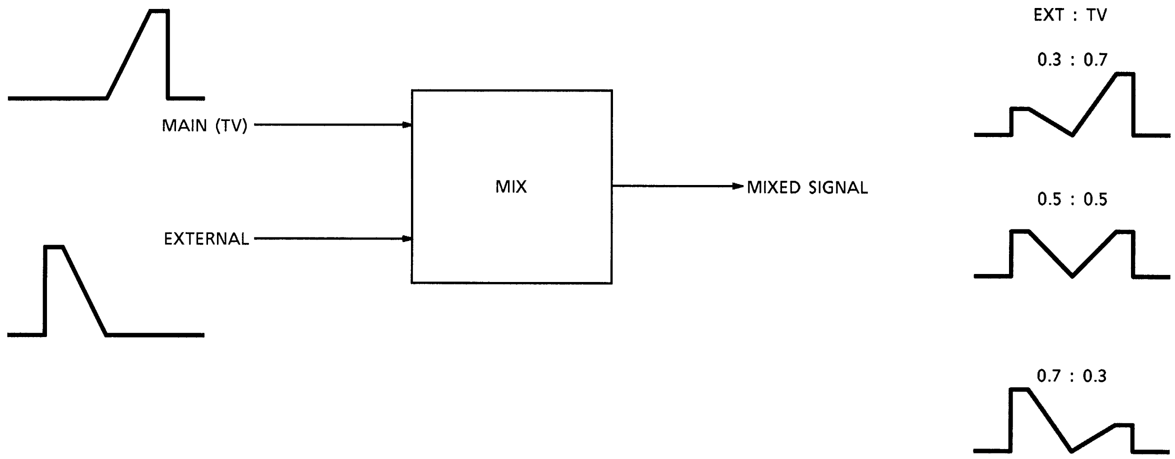


Table The mixing ratio of external to main (TV)

YS1	YS2	YS3	THE MIXING RATIO	
			EXTERNAL	MAIN (TV)
L	L	L	0	1
H	L	L	0.3	0.7
L	H	L	0.4	0.6
H	H	L	0.5	0.5
L	L	H	0.6	0.4
H	L	H	0.7	0.3
L	H	H	0.8	0.2
H	H	H	1	0

MATRIX CONTROL

Pin 16 is a high-speed switch to control the matrix mode for output signals.

Table Matrix mode depending on by the voltage of pin 16

VOLTAGE OF PIN 16 [V]	MODE
0 ~ 0.7	Through
~ 2.3	RGB → YUV (PAL)
~ 3.8	RGB → YUV (NTSC)
3.8 ~	RGB → YIQ

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Supply Voltage		V_{CCmax}	14	V
Signal Voltage at Each Input Pin		e_{inmax}	9	V_{p-p}
Power Consumption	TA1287P	P_{DD} (Note 1)	1400	mW
	TA1287F	P_{DF} (Note 1)	641	
Power Consumption Reduction Ratio	TA1287P	$1 / θ_{jaD}$	−11.2	mW / °C
	TA1287F	$1 / θ_{jaF}$	−5.13	
Operating Temperature		T_{opr}	−20~65	°C
Storage Temperature		T_{stg}	−55~150	°C

Note 1: Refer to the figure below.
Note 2: It is possible that TA1287F function faultily caused by leak problems according to a field intensity from CRT. Put IC lay-out position to CRT be far more than 20 cm. If there is not a enough distance, intercept it by a shield.

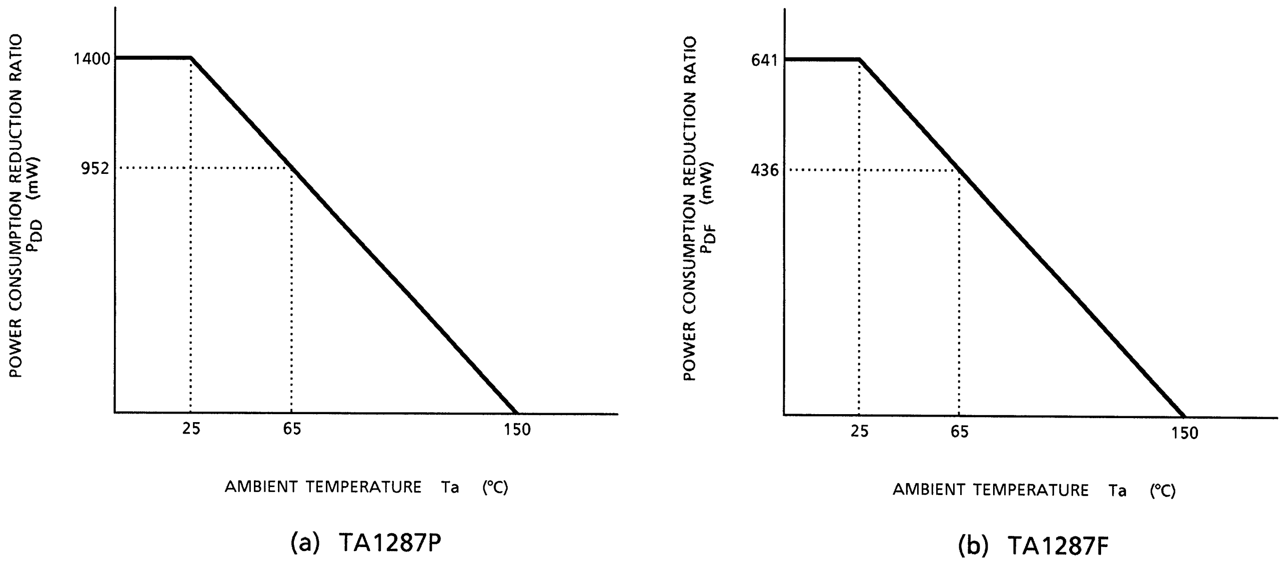


Fig. Power consumption reduction against ambient temperature

RECOMMENDED OPERATING CONDITIONS

CHARACTERISTIC	DESCRIPTION	MIN	TYP.	MAX	UNIT
Supply Voltage	Pin 12	8.1	9.0	9.9	V
Y Input Signal Level	White : 100% with sync.	—	1.0	—	V_{p-p}
U Input Signal Level	B : C = 1 : 1	—	300	—	mV_{p-p}
V Input Signal Level	B : C = 1 : 1	—	300	—	mV_{p-p}
R Input Signal Level	100% white	—	700	—	mV_{p-p}
G Input Signal Level	100% white	—	700	—	mV_{p-p}
B Input Signal Level	100% white	—	700	—	mV_{p-p}
CP Input Level	Pin 4	1.1	1.5	5.0	V
YS1, YS2, YS3, Input Level	Pin 9, 10, 11	1.1	1.5	5.0	V

ELECTRICAL CHARACTERISTICS
(V_{CC} = 9V and Ta = 25°C, unless otherwise specified)
Current consumption

PIN NAME	SYMBOL	TESTCIRCUIT	MIN	TYP.	MAX	UNIT
V_{CC}	I_{CC}	—	20.0	26.0	32.0	mA

Terminal voltages

PIN No.	PIN NAME	SYMBOL	TEST CIRCUIT	MIN.	TYP.	MAX.	UNIT
1	V_{IN}	V_1	—	6.0	6.2	6.4	V
2	Y_{IN}	V_2	—	6.0	6.2	6.4	
3	U_{IN}	V_3	—	6.0	6.2	6.4	
6	R_{IN}	V_6	—	6.0	6.2	6.4	
7	G_{IN}	V_7	—	6.0	6.2	6.4	
8	B_{IN}	V_8	—	6.0	6.2	6.4	
13	V_{OUT}	V_{13}	—	4.5	4.7	4.9	
14	Y_{OUT}	V_{14}	—	4.5	4.7	4.9	
15	U_{OUT}	V_{15}	—	4.5	4.7	4.9	

AC CHARACTERISTICS

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
YUV Gain	GTRY	—	(Note A_1)	−0.5	0	0.5	dB
(Through Mode)	GTY			−0.5	0	0.5	
	GTBY			−0.5	0	0.5	
RGB Gain	GRR	—	(Note A_2)	−0.5	0	0.5	dB
(Through Mode)	GRG			−0.5	0	0.5	
	GRB			−0.5	0	0.5	
R Gain (Input to Pin 6)	GRRYP	—	(Note A_3)	−4.7	−4.2	−3.7	dB
(Matrix Mode)	GRYP			−10.3	−9.8	−9.3	
	GRBYP			−17.3	−16.8	−16.3	
	GRRYN			−4.3	−3.8	−3.3	
	GRYN			−10.3	−9.8	−9.3	
	GRBYN			−18.4	−17.9	−17.4	
	GRRYI			−4.6	−4.1	−3.6	
	GRYI			−10.3	−9.8	−9.6	
	GRBYI			−13.0	−12.5	−12.0	
G Gain (Input to Pin 7)	GGRYP	—	(Note A_4)	−6.3	−5.8	−5.3	dB
(Matrix Mode)	GGYP			−4.5	−4.0	−3.5	
	GGBYP			−11.5	−11.0	−10.5	
	GGRYN			−5.9	−5.4	−4.9	
	GGYN			−4.5	−4.0	−3.5	
	GGBYN			−10.9	−10.4	−9.9	
	GGRYI			−11.5	−11.0	−10.5	
	GGYI			−4.5	−4.0	−3.5	
	GGBYI			−5.6	−5.1	−4.6	
B Gain (Input to Pin 8)	GBRYP	—	(Note A_5)	−21.1	−20.6	−20.1	dB
(Matrix Mode)	GBYP			−19.1	−18.6	−18.1	
	GBBYP			−7.7	−7.2	−6.7	
	GBRYN			−20.3	−19.8	−19.3	
	GBYN			−19.1	−18.6	−18.1	
	GBBYN			−7.9	−7.4	−6.9	
	GBRYI			−10.2	−9.7	−9.2	
	GBYI			−19.1	−18.6	−18.1	
	GBBYI			−10.7	−10.2	−9.7	
R-Y Gain (Input to Pin 1)	GTRY73	—	(Note A_6)	−3.7	−3.2	−2.7	dB
(Matrix Mode)	GTRY64			−5.0	−4.5	−4.0	
	GTRY55			−6.6	−6.1	−5.6	
	GTRY46			−8.5	−8.0	−7.5	
	GTRY37			−11.0	−10.5	−10.0	
	GTRY28			−14.3	−13.8	−13.3	

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Y Gain (Input to Pin 2)	GTY73	—	(Note A_7)	−3.7	−3.2	−2.7	dB
(Mixing Mode)	GTY64			−5.0	−4.5	−4.0	
	GTY55			−6.6	−6.1	−5.6	
	GTY46			−8.5	−8.0	−7.5	
	GTY37			−11.0	−10.5	−10.0	
	GTY28			−14.3	−13.8	−13.3	
B-Y Gain (Input to Pin 3)	GTBY73	—	(Note A_8)	−3.7	−3.2	−2.7	dB
(Mixing Mode)	GTBY64			−5.0	−4.5	−4.0	
	GTBY55			−6.6	−6.1	−5.6	
	GTBY46			−8.5	−8.0	−7.5	
	GTBY37			−11.0	−10.5	−10.0	
	GTBY28			−14.3	−13.8	−13.3	
R Gain (Input to Pin 6)	GRR37	—	(Note A_9)	−3.7	−3.2	−2.7	dB
(Mixing Mode)	GRR46			−5.0	−4.5	−4.0	
	GRR55			−6.6	−6.1	−5.6	
	GRR64			−8.5	−8.0	−7.5	
	GRR73			−11.0	−10.5	−10.0	
	GRR82			−14.3	−13.8	−13.3	
G Gain (Input to Pin 7)	GRG37	—	(Note A_{10})	−3.7	−3.2	−2.7	dB
(Mixing Mode)	GRG46			−5.0	−4.5	−4.0	
	GRG55			−6.6	−6.1	−5.6	
	GRG64			−8.5	−8.0	−7.5	
	GRG73			−11.0	−10.5	−10.0	
	GRG82			−14.3	−13.8	−13.3	
B Gain (Input to Pin 8)	GRB37	—	(Note A_{11})	−3.7	−3.2	−2.7	dB
(Mixing Mode)	GRB46			−5.0	−4.5	−4.0	
	GRB55			−6.6	−6.1	−5.6	
	GRB64			−8.5	−8.0	−7.5	
	GRB73			−11.0	−10.5	−10.0	
	GRB82			−14.3	−13.8	−13.3	
YUV Input Dynamic Range	DTV	—	(Note A_{12})	1.2	1.5	1.7	V_{p-p}
(Through Mode)	DTY			1.2	1.5	1.7	
	DTU			1.2	1.5	1.7	
RGB Input Dynamic Range	DRR	—	(Note A_{13})	1.2	1.5	1.7	V_{p-p}
(Through Mode)	DRG			1.2	1.5	1.7	
	DRB			1.2	1.5	1.7	
R Input Dynamic Range	DRP	—	(Note A_{14})	1.2	1.5	1.7	V_{p-p}
(Input to Pin 6)	DRNU			1.2	1.5	1.7	
(Matrix Mode)	DRNI			1.2	1.5	1.7	
G Input Dynamic Range	DGP	—	(Note A_{15})	1.2	1.5	1.7	V_{p-p}
(Input to Pin 7)	DGNU			1.2	1.5	1.7	
(Matrix Mode)	DGNI			1.2	1.5	1.7	

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
B Input Dynamic Range	DBP	—	(Note A_{16})	1.2	1.5	1.7	V_{p-p}
(Input to Pin 8)	DBNU			1.2	1.5	1.7	
(Matrix Mode)	DBNI			1.2	1.5	1.7	
YUV Input and Output	GfTRY	—	(Note A_{17})	30	—	—	MHz
Frequency Characteristic	GfTY			30	—	—	
(At −3 dB Point)	GfTBY			30	—	—	
(Through Mode)							
RGB Input and Output	GfRR	—	(Note A_{18})	30	—	—	MHz
Frequency Characteristic	GfRG			30	—	—	
(At −3 dB Point)	GfRB			30	—	—	
(Through Mode)							
Ys Switching Delay Time	YsRYR	—	(Note A_{19})	—	25.0	40.0	ns
	YsRRY				20.0	40.0	
	YsYG				25.0	40.0	
	YsGY				20.0	40.0	
	YsBYB				25.0	40.0	
	YsBBY				20.0	40.0	
Crosstalk between Each Input	—	—	(Note A_{20})	—	−50	−40	dB

TEST CONDITION

NOTE	ITEM	TEST CONDITION (UNLESS OTHERWISE SPECIFIED, V_{CC} = 9 V and Ta = 25 ± 3°C)						
		SW MODE						MEASURING METHOD
		SW_9	SW_{10}	SW_{11}	SW_{16A}	SW_{16B}	SW_{16C}	
								<Common test condition> 1) V_{CC} = 9 V and Ta = 25 ± 3°C. 2) ALL switch modes are B, unless otherwise specified.
A_1	YUV Gain (Through Mode)	B	B	B	B	B	B	1) Input Signal 1 into pin 4 2) Supply DC 0 V to YS1 (pin 9), YS2 (pin 10), YS (pin 11). 3) Input Signal 2 (f_0 = 100 kHz, V_0 = 0.2 Vp-p) into V-IN (pin 1, SW_1 = A). 4) Measure the amplitude of V-OUT at pin 13. Calculate the gain. (GTRY) 5) Calculate gains of Y-IN to Y-OUT and U-IN to U-OUT, in the same way as 3) to 4) GTY : Y-IN (pin 2) → Y-OUT (pin 14) GTBY : U-IN (pin 3) → U-OUT (pin 15)
A_2	RGB Gain (Through Mode)	A	A	A	B	B	B	1) Calculate gains against R, G and B, in the same way as NOTE A_1. GRR : SW_6 = A, R-IN (pin 6) → V-OUT (pin 13) GRG : SW_7 = A, R-IN (pin 7) → Y-OUT (pin 14) GRB : SW_8 = A, R-IN (pin 8) → U-OUT (pin 15)

NOTE	ITEM	TEST CONDITION (UNLESS OTHERWISE SPECIFIED, V_{CC} = 9 V and Ta = 25 ± 3°C)						
		SW MODE						MEASURING METHOD
		SW_9	SW_{10}	SW_{11}	SW_{16A}	SW_{16B}	SW_{16C}	
A_3	R Gain (Input to Pin 6) (Matrix Mode)							1) Calculate gains against each item, in the same way as NOTE A_1.
		A	A	A	B	B	A	(PAL) GRRYP : R-IN (pin 6) → V-OUT (pin 13) GRYP : R-IN (pin 6) → Y-OUT (pin 14) GRBYP : R-IN (pin 6) → U-OUT (pin 15)
					A	B	A	(NTSC, UV) GRRYN : R-IN (pin 6) → V-OUT (pin 13) GRYN : R-IN (pin 6) → Y-OUT (pin 14) GRBYN : R-IN (pin 6) → U-OUT (pin 15)
					A	A	A	(NTSC, IQ) GRRYI : R-IN (pin 6) → V-OUT (pin 13) GRYI : R-IN (pin 6) → Y-OUT (pin 14) GRBYI : R-IN (pin 6) → U-OUT (pin 15)

NOTE	ITEM	TEST CONDITION (UNLESS OTHERWISE SPECIFIED, V_{CC} = 9 V and Ta = 25 ± 3°C)						
		SW MODE						MEASURING METHOD
		SW_9	SW_{10}	SW_{11}	SW_{16A}	SW_{16B}	SW_{16C}	
A_4	G Gain (Input to Pin 7) (Matrix Mode)	A	A	A	B A A	B B A	A A A	1) Calculate gains against each item, in the same way as NOTE A_1. (PAL) GGRYP : G-IN (pin 7) → V-OUT (pin 13) GGYP : G-IN (pin 7) → Y-OUT (pin 14) GGBYP : G-IN (pin 7) → U-OUT (pin 15) (NTSC, UV) GGRYN : G-IN (pin 7) → V-OUT (pin 13) GGYN : G-IN (pin 7) → Y-OUT (pin 14) GGBYN : G-IN (pin 7) → U-OUT (pin 15) (NTSC, IQ) GGRYI : G-IN (pin 7) → V-OUT (pin 13) GGYI : G-IN (pin 7) → Y-OUT (pin 14) GGBYI : G-IN (pin 7) → U-OUT (pin 15)

NOTE	ITEM	TEST CONDITION (UNLESS OTHERWISE SPECIFIED, V_{CC} = 9 V and Ta = 25 ± 3°C)						
		SW MODE						MEASURING METHOD
		SW_9	SW_{10}	SW_{11}	SW_{16A}	SW_{16B}	SW_{16C}	
A_5	B Gain (Input to Pin 8) (Matrix Mode)	A	A	A	B	B	B	1) Calculate gains against each item, in the same way as NOTE A_1. (PAL) GGRYP : B-IN (pin 8) → V-OUT (pin 13) GGYP : B-IN (pin 8) → Y-OUT (pin 14) GGBYP : B-IN (pin 8) → U-OUT (pin 15)
					A	B	A	(NTSC, UV) GGRYN : B-IN (pin 8) → V-OUT (pin 13) GGYN : B-IN (pin 8) → Y-OUT (pin 14) GGBYN : B-IN (pin 8) → U-OUT (pin 15)
					A	A	A	(NTSC, IQ) GGRYI : B-IN (pin 8) → V-OUT (pin 13) GGYI : B-IN (pin 8) → Y-OUT (pin 14) GGBYI : B-IN (pin 8) → U-OUT (pin 15)

NOTE	ITEM	TEST CONDITION (UNLESS OTHERWISE SPECIFIED, V_{CC} = 9 V and Ta = 25 ± 3°C)						
		SW MODE						MEASURING METHOD
		SW_9	SW_{10}	SW_{11}	SW_{16A}	SW_{16B}	SW_{16C}	
A_6	R-Y Gain (Input to Pin 1) (Mixing Mode)	A B A B A B	B A A B B A	B B B A A A	B	B	B	1) Input Signal into pin 4. 2) Supply DC 0V to YS1 (pin 9), YS2 (pin 10), YS3 (pin 11). 3) Input Signal 2 (f_0 = 100 kHz, V_0 = 0.2 V_{p-p}) into V-IN (pin 1, SW_1 = A). 4) Measure each amplitude of output signal from V-OUT (pin 13) in each SW MODE. Calculate the gains.
A_7	Y Gain (Input to Pin 2) (Mixing Mode)	A B A B A B	B A A B B A	B B B A A A	B	B	B	1) Calculate gains of Y-IN (pin 2) to Y-OUT (pin 14), in the same way as NOTE A_6. (SW_2 = A)
A_8	B-Y Gain (Input to Pin 3) (Mixing Mode)	A B A B A B	B A A B B A	B B B A A A	B	B	B	1) Calculate gains of U-IN (pin 3) to Y-OUT (pin 15), in the same way as NOTE A_6. (SW_3 = A)
A_9	R Gain (Input to Pin 6) (Mixing Mode)	A B A B A B	B A A B B A	B B B A A A	B	B	B	1) Calculate gains of R-IN (pin 6) to V-OUT (pin 13), in the same way as NOTE A_6. (SW_6 = A)
A_{10}	G Gain (Input to Pin 7) (Mixing Mode)	A B A B A B	B A A B B A	B B B A A A	B	B	B	1) Calculate gains of G-IN (pin 7) to Y-OUT (pin 14), in the same way as NOTE A_6. (SW_7 = A)

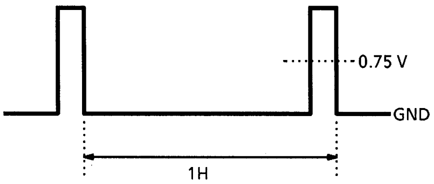
NOTE	ITEM	TEST CONDITION (UNLESS OTHERWISE SPECIFIED, V_{CC} = 9 V and Ta = 25 ± 3°C)						
		SW MODE						MEASURING METHOD
		SW_9	SW_{10}	SW_{11}	SW_{16A}	SW_{16B}	SW_{16C}	
A_{11}	B Gain (Input to Pin 8) (Mixing Mode)	A B A B A B	B A A B B A	B B B A A A	B	B	B	1) Calculate gains of B-IN (pin 8) to U-OUT (pin 15), in the same way as NOTE A_6. (SW_8 = A)
A_{12}	YUV Input Dynamic Range (Through Mode)	B	B	B	B	B	B	1) Input Signal into pin 4. 2) Supply DC 0V to YS1 (pin 9), YS2 (pin 10), YS3 (pin 11). 3) Input Signal 2 (f_0 = 100 kHz, V_0 = 0.2 V_{p-p}) into V-IN (pin 1, SW_1 = A). 4) Increase the amplitude of input-signal 2 gradually. Measure the biggest amplitude of input-signal 2 without any distortion on V-OUT wave shape. (DTRY) 5) Measure in the same way as (pin 3) to (pin 4) for Y-IN (pin 2, SW_2 = A) and U-IN (pin 3, SW_3 = A), DTY : Y-IN (pin 2) → Y-OUT (pin 14) DTBY : U-IN (pin 3) → U-OUT (pin 15)
A_{13}	RGB Input Dynamic Range (Through Mode)	B	B	B	B	B	B	1) Measure in the same way as NOTE A_{12} for R-IN (pin 6, SW_6 = A) G-IN (pin 7, SW_7 = A) and B-IN (pin 8, SW_8 = A).
A_{14}	R Input Dynamic Range (Input to Pin 6) (Matrix Mode)	A	A	A	B A A	B B A	A A A	1) For each combination of $SW_{16A,\ 16B}$ and $_{16C}$, measure each item in the same way as 1) to 4) of NOTE A_{12}. (SW_6 = A, R-IN (pin 6) → V-OUT (pin 13)) DRP : PAL DRNU : NTSC, UV DRNI : NTSC, IQ

NOTE	ITEM	TEST CONDITION (UNLESS OTHERWISE SPECIFIED, V_{CC} = 9 V and Ta = 25 ± 3°C)						
		SW MODE						MEASURING METHOD
		SW_9	SW_{10}	SW_{11}	SW_{16A}	SW_{16B}	SW_{16C}	
A_{15}	G Input Dynamic Range (Input to Pin 7) (Matrix Mode)	A	A	A	B A A	B B A	A A A	1) Measure each item in the same way as NOTE A_{14}. (SW_7 = A, G-IN (pin 7) → Y-OUT (pin 14)) DGP : PAL DGNU : NTSC, UV DGNI : NTSC, IQ
A_{16}	B Input Dynamic Range (Input to Pin 8) (Matrix Mode)	A	A	A	B A A	B B A	A A A	1) Measure each item in the same way as NOTE A_{14} (SW_8 = A, B-IN (pin 8) → U-OUT (pin 15)) DBP : PAL DBNU : NTSC, UV DBNI : NTSC, IQ
A_{17}	YUV Input and Output Frequency Characteristic (At −3 dB Point) (Through Mode)	B	B	B	B	B	B	1) Input Signal 1 into pin 4. 2) Supply DC 0V to YS1 (pin 9), YS2 (pin 10), YS3 (pin 11). 3) Input Signal 2 (f_0 = 30 MHz, V_0 = 0.2 V_{p-p}) into V-IN (pin 1, SW_1 = A). 4) Measure the amplitude during picture period on V-OUT (pin13). (v_{13}-30 MHz) 5) Calculate the frequency gain by using the following equation and v_{13}, which is measured as the output amplitude in NOTE A_1. GfTRY = 20 ℓog (v_{13}-30 MHz / v_{13}) 6) Calculate following items, in the same way as clause 5). GfTY : Y-IN (pin 2) → Y-OUT (pin 14) GfTBY : U-IN (pin 3) → U-OUT (pin 15)

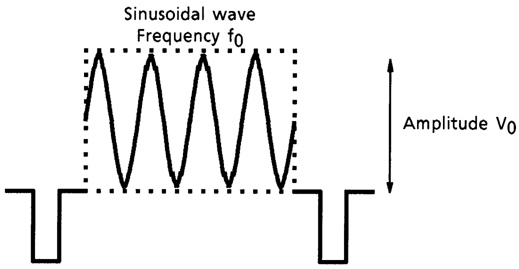
NOTE	ITEM	TEST CONDITION (UNLESS OTHERWISE SPECIFIED, V_{CC} = 9 V and Ta = 25 ± 3°C)						
		SW MODE						MEASURING METHOD
		SW_9	SW_{10}	SW_{11}	SW_{16A}	SW_{16B}	SW_{16C}	
A_{18}	RGB Input and Output Frequency Characteristic (At −3 dB Point) (Through Mode)	A	A	A	B	B	B	1) In the same way as NOTE A_{17}, calculate items against R-IN (pin 6, SW_6 = A), G-IN (pin 7, SW_7 = A) and B-IN (pin 8, SW_8 = A). GfRR : R-IN (pin 6) → V-OUT (pin 13) GfRG : G-IN (pin 7) → Y-OUT (pin 14) GfRB : B-IN (pin 8) → U-OUT (pin 15)
A_{19}	Ys Switching Delay Time	—	—	—	B	B	B	1) Input Signal 1 into pin 4. 2) Input Signal 3 into R-IN (pin 6, SW_6 = A). Input Signal 4 into YS1 (pin 9), YS2 (pin 10), YS3 (pin 11). 3) Measure (I) and (II) periods on V-OUT (pin 13). 4) Measure in the same way as 2) to 3) for G-IN (pin 7, SW_7 = A) and B-IN (pin 8, SW_8 = A). R-IN (I) : YsRYR (II) : YsRYR G-IN (I) : YsYG (II) : YsYG B-IN (I) : YsBYB (II) : YsBBY
A_{20}	Crosstalk between Each Input	A or B	A or B	A or B	B	B	B	1) Input Signal into pin 4. 2) Supply DC 0V to YS1 (pin 9), YS2 (pin 10), YS3 (pin 11). 3) Input Signal 2 (f_0 = 4 MHz, V_0 = 0.5 $V_{p\text{-}p}$) into V-IN (pin 1, SW_1 = A). 4) Changing SW_9, SW_{10}, and SW_{11} against each case, measure each leak levels. 5) Calculate the gains, input level to leak level.

TEST SIGNALS

Signal 1



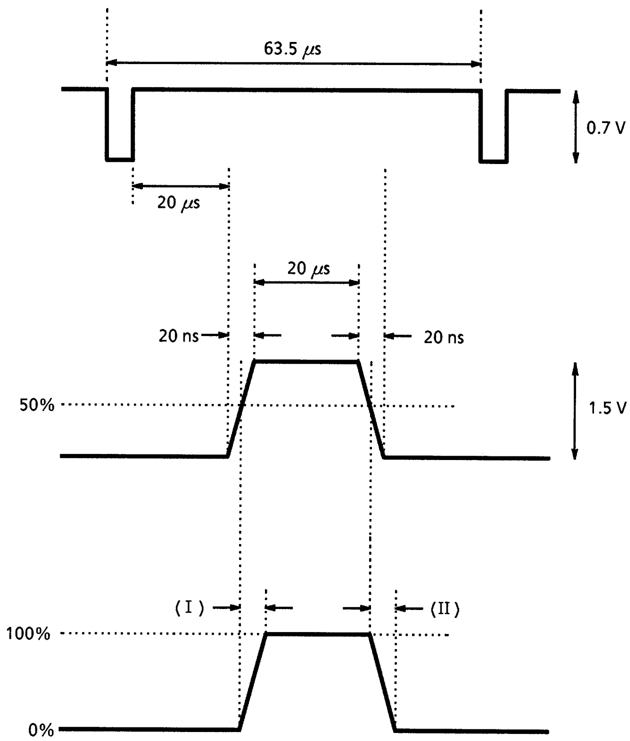
Signal 2



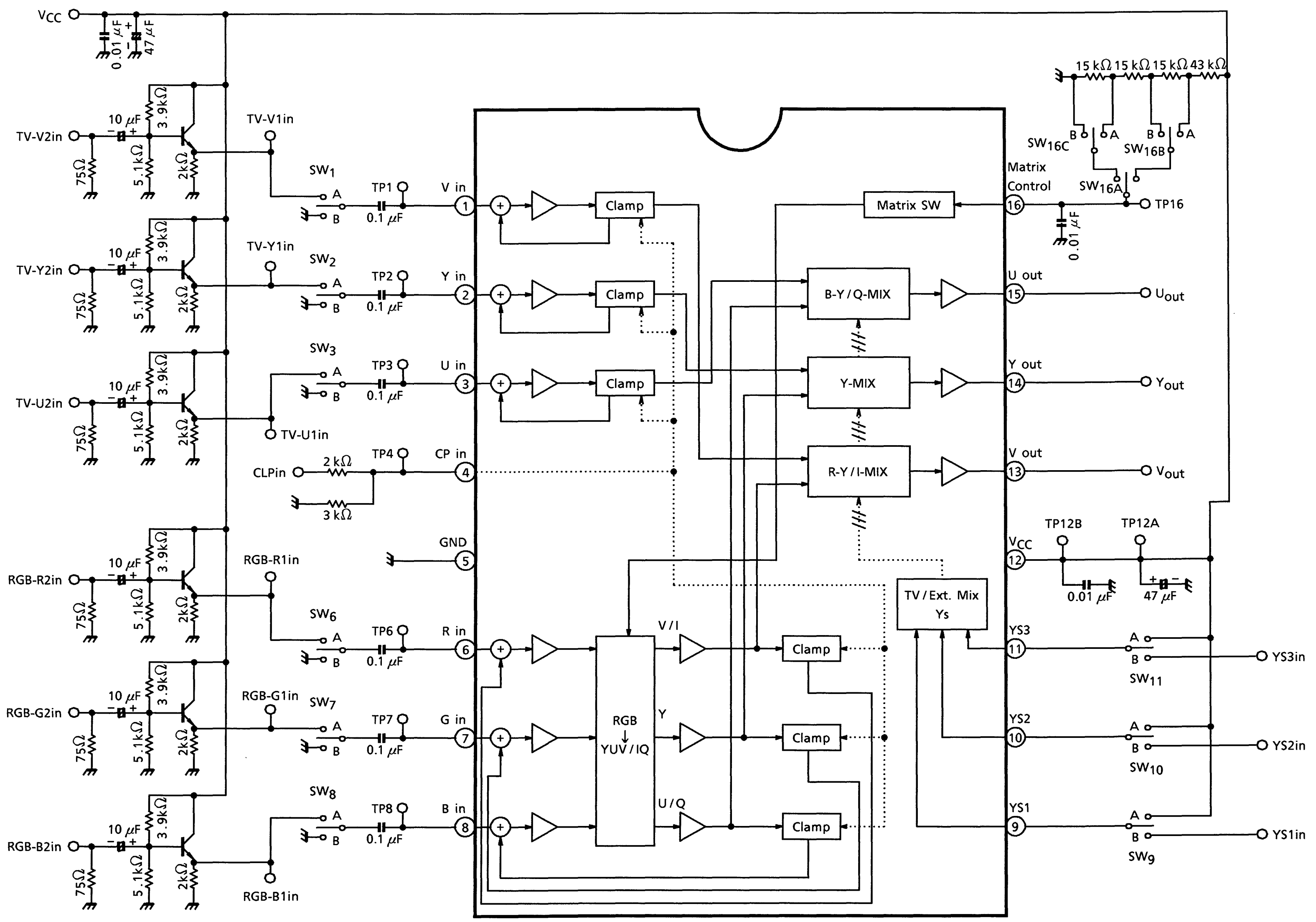
Signal 3

Signal 4

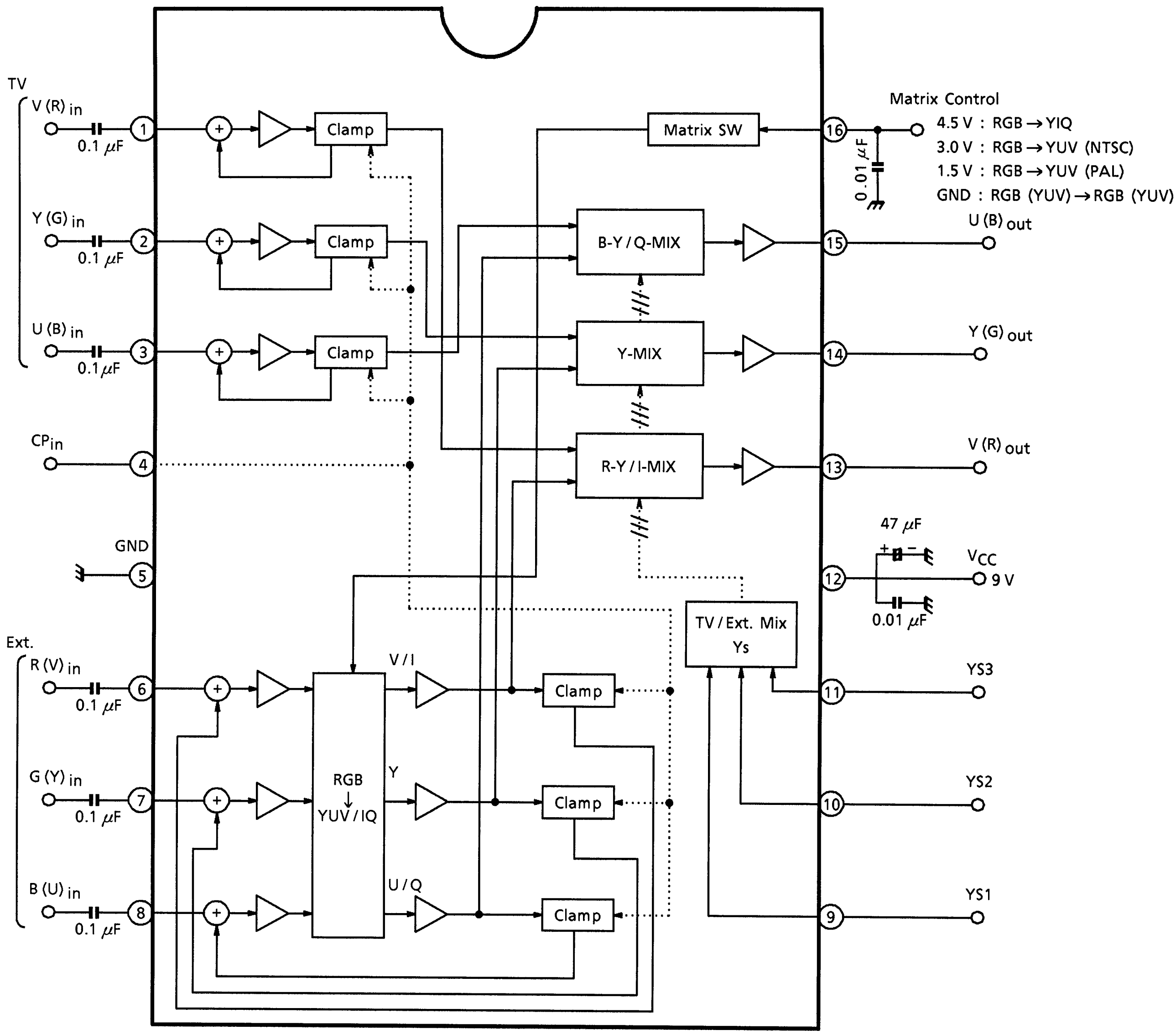
Output wave-form



TEST CIRCUIT



APPLICATION CIRCUIT

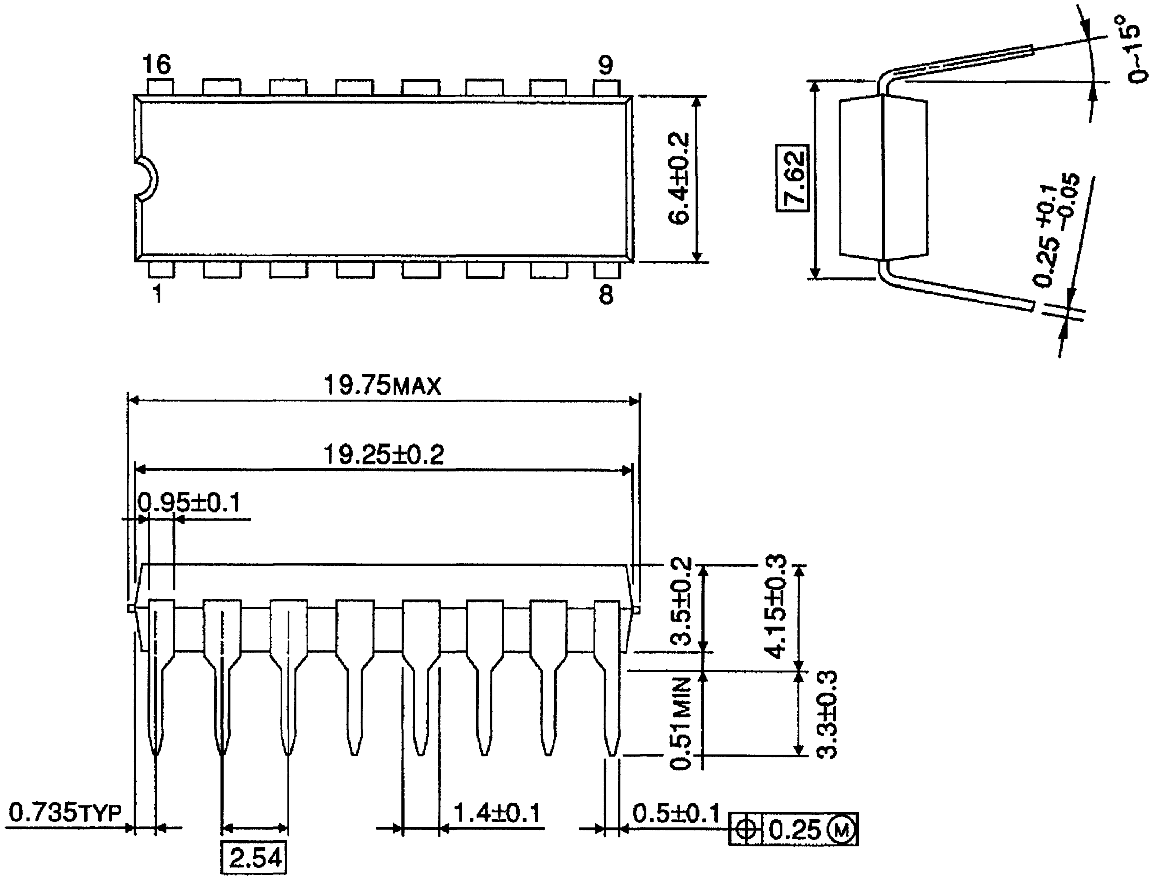


THE MIXING RATIO TABLE FOR EXTERNAL TO TV

Ys1	Ys2	Ys3	EXT : TV
L	L	L	0 : 1
H	L	L	0.3 : 0.7
L	H	L	0.4 : 0.6
H	H	L	0.5 : 0.5
L	L	H	0.6 : 0.4
H	L	H	0.7 : 0.3
L	H	H	0.8 : 0.2
H	H	H	1 : 0

PACKAGE DIMENSIONS

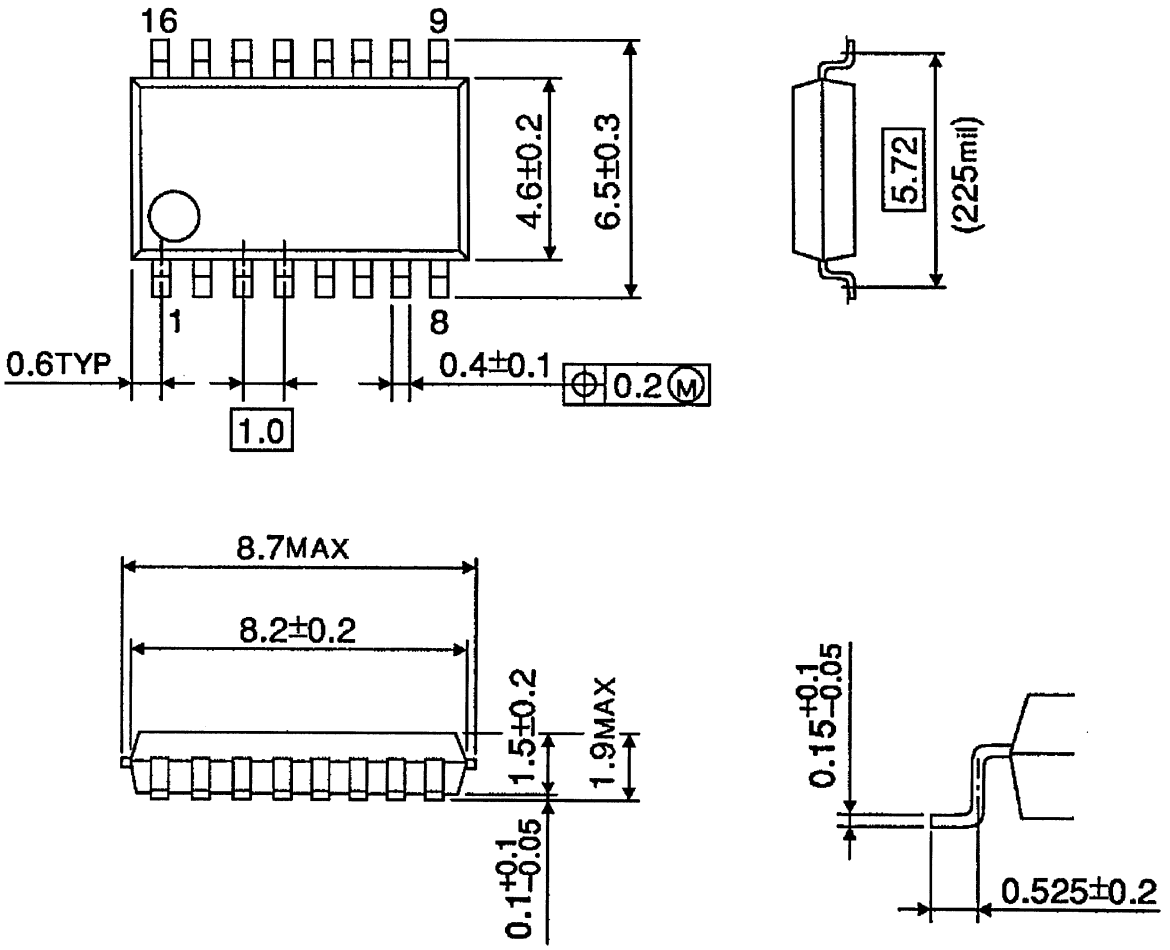
DIP16-P-300-2.54A Unit : mm



Weight: 1.0g (Typ.)

PACKAGE DIMENSIONS

SSOP16-P-225-1.00A Unit : mm



Weight: 0.14g (Typ.)