Ordering number : EN 4955

Monolithic Linear IC

SANYO No.4955

LA7152

VCR Electronic Switch

Overview

The LA7152 is a three-input (clamped input) single-output analog switch for video signals. The LA7152 high input impedance structure allows 0.01 μF ceramic capacitors to be used as the input coupling capacitors.

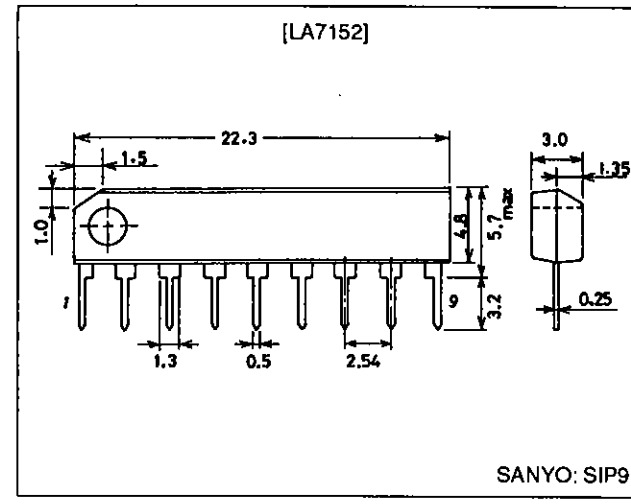
Features

- Three inputs - one output
- Built-in video clamping circuits
- Built-in muting function

Package Dimensions

unit: mm

3017C-SIP9



Specifications

Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC} max		7.0	V
Allowable power dissipation	Pd max		100	mW
Operating temperature	Topr		−10 to +70	°C
Storage temperature	Tstg		−40 to +150	°C

Recommended Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V_{CC}		5.0	V
Operating supply voltage range	Vopg		4.5 to 6.0	V

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Operating Characteristics at Ta = 25°C, V_{CC} = 5 V

Parameter	Symbol	Conditions	min	typ	max	Unit
Current drain	I_{CC}	*1	3.0	4.1	5.2	mA
Maximum input level	V_{IN} max	*2	2.0	2.5		Vp-p
Frequency characteristics	Gf	*3		0	±0.5	dB
Total harmonic distortion	THD	*4		0.03	0.1	%
Inter-channel crosstalk	CT_C	*5		–65	–60	dB
Muting circuit crosstalk	CT_M	*6		–55	–50	dB
Output DC offset	ΔV_{OUT}	*7		5	20	mV
Differential gain	DG	*8		0.5	1	%
Differential phase	DP	*9		0.5	1	deg

Note: 1. Current drain
S1 = S2 = S3 = 2, S4 = S5 = S6 = 3

2. Maximum input level (input C = 10 µF)
S1 = 1, S4 = 1, S2 = S3 = 2, S5 = S6 = 3,
S2 = 1, S5 = 1, S1 = S3 = 2, S4 = S6 = 3,
S3 = 1, S1 = S2 = 2, S4 = S5 = S6 = 3
For each of the above three conditions, with an input signal frequency f = 1 kHz, gradually increase the input signal level and determine the level where the total harmonic distortion reaches 0.1%.

3. Frequency characteristics
For each of the three conditions in Note 2,
V_{IN} = 2.0 V_{p-p}, V_{OUT} (5 MHz)/V_{OUT} (100 KHz)

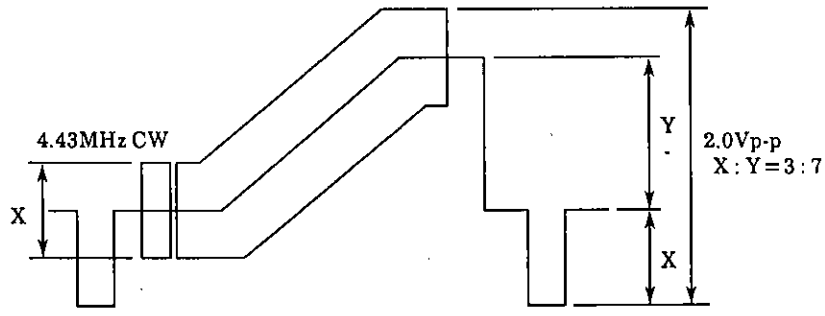
4. Total harmonic distortion (input C = 10 µF)
For each of the three conditions in item 2, measure the total harmonic distortion with V_{IN} = 2.0 V_{p-p} and f = 1 kHz.

5. Crosstalk
With S6 = 3, measure in the modes for all combinations of S1 to S5 except for the following three conditions: a) S1 = S4 = 1, b) S2 = S5 = 1 and c) S3 = 1, S4 = S5 = 3.
V_{IN} = 2.0 V_{p-p}, f = 4.43 MHz, V_{OUT}/V_{IN}

6. Muting circuit crosstalk
With S6 = 1, measure in the modes for all combinations of S1 to S5.
V_{IN} = 2.0 V_{p-p}, f = 4.43 MHz, V_{OUT}/V_{IN}

7. Output DC offset
Measure the output DC voltage difference between the following modes with S1 = S2 = S3 = 2.
a. S4 = 1, S5 = S6 = 3
b. S5 = 1, S4 = S6 = 3
c. S4 = S5 = S6 = 3
d. S6 = 1, S4 = S5 = 1 or 2

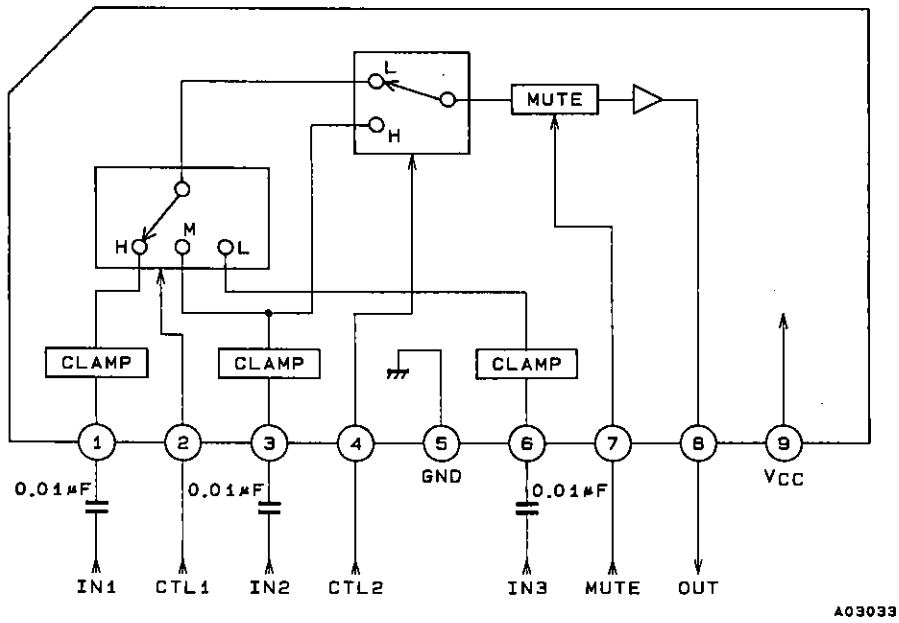
8, 9. Differential gain, differential phase



Switching Characteristics at Ta = 25°C, V_{CC} = 5 V

Parameter		Symbol	Conditions	min	typ	max	Unit
CTL1	H	$V_{C1}H$	In the state with S4 = 2, S5 = 2 and S6 = 2, measure the control voltage level when the input signal switches.	3.5		V_{CC}	V
	M	$V_{C1}M$		1.5		3.0	V
	L	$V_{C1}L$		0		1.0	V
CTL2	H	$V_{C2}H$		2.5		V_{CC}	V
	L	$V_{C2}L$		0		1.5	V
MUTE	H	$V_{CM}H$		3.0		V_{CC}	V
	L	$V_{CM}L$		0		1.5	V

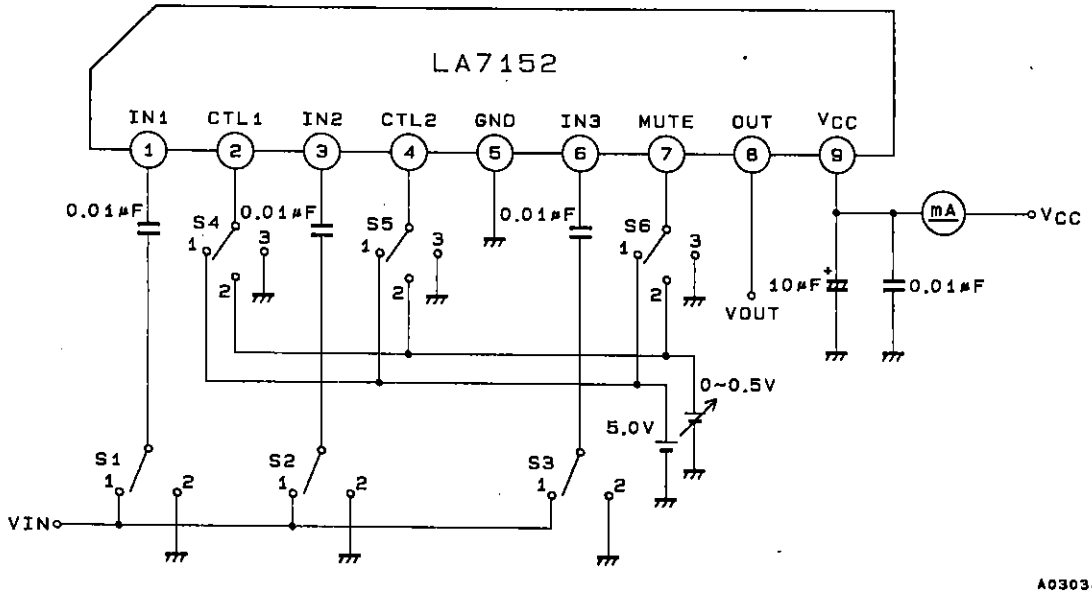
Equivalent Circuit Block Diagram and Application Circuit Diagram



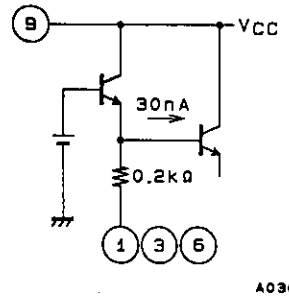
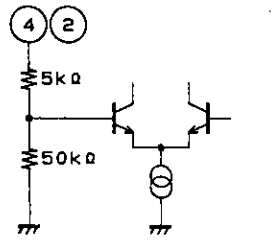
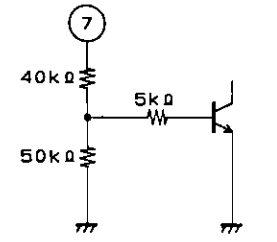
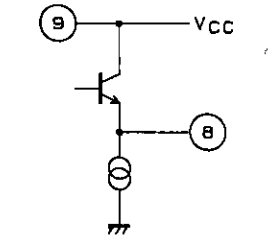
Truth Table

CTL1	L	L	M	M	H	H	—
CTL2	L	H	L	H	L	H	—
MUTE	L	L	L	L	L	L	H
OUT	IN3	IN2	IN2	IN2	IN1	IN2	DC

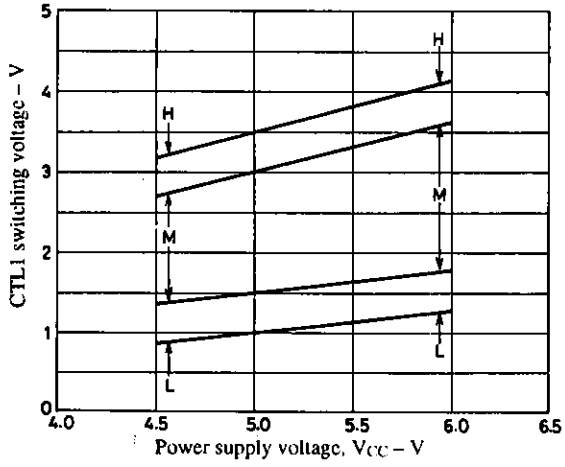
Test Circuit



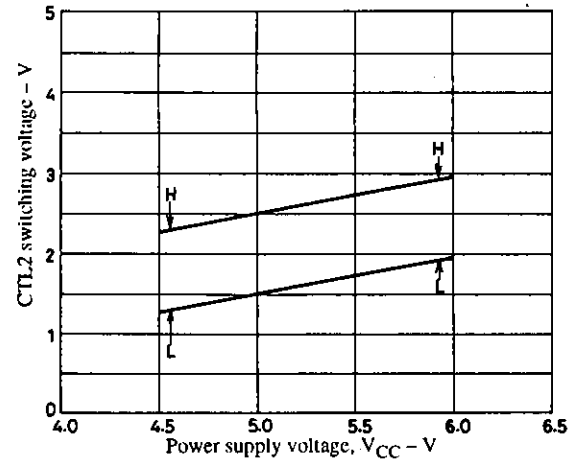
Pin Functions

Pin No.	Symbol	I/O type	Note
1 3 6	IN1 IN2 IN3		High impedance input
2 4	CONTROL1 CONTROL2		Tie CONTROL2 (pin 4) to ground when using three-value control by CONTROL1 (pin 2).
5	GND		
7	MUTE CONTROL		
8	OUT		Collector current: 1.3 mA
9	V_{CC}		

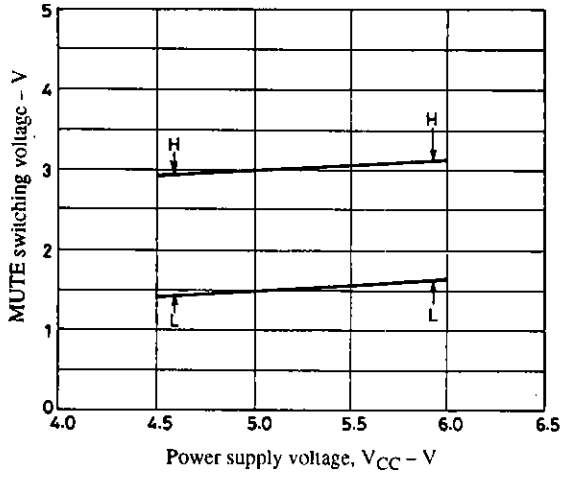
Dependence of CTL1 switching voltage on supply voltage



Dependence of CTL2 switching voltage on supply voltage



Dependence of MUTE switching voltage on supply voltage



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