

M52472P

4-INPUT 3-CHANNEL ANALOG SWITCH

DESCRIPTION

The M52472P is a semiconductor integrated circuit containing analog switches designed for use in a video system. It contains two audio switches and one video switch. Each switch has four inputs and can be simultaneously controlled. In addition, the video switch contains an amplifier with again of about 7.0 dB.

FEATURES

- Video and stereo sound switches in one package
- Wide frequency range(video switch)..... DC~10MHz
- High separation(video)..... Crosstalk 60dB(typ.)(@5MHz)

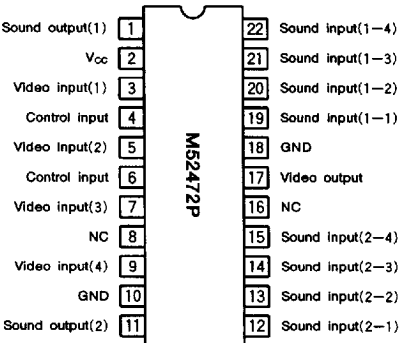
APPLICATION

Video equipment.

RECOMMENDED OPERATING CONDITION

Supply voltage range.....5~14V

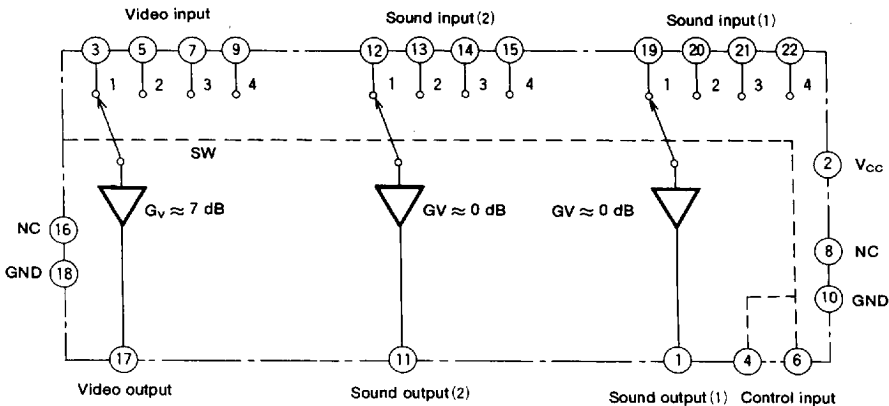
PIN CONFIGURATION (TOP VIEW)



Outline 22P4

NC : NO CONNECTION

BLOCK DIAGRAM



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4-INPUT 3-CHANNEL ANALOG SWITCH

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Ratings	Unit
Vcc	Supply voltage	14	V
Vic	Control voltage	0~Vcc	V
Pd	Power dissipation	1.6	W
Topr	Operating temperature	-20~75	℃
Tstg	Storage temperature	-40~125	℃

ELECTRICAL CHARACTERISTICS (Ta=25℃, Vcc=12V, unless oterwise noted)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
Icc	Circuit current		—	21	30	mA
Vidc	Input bias voltage	Sound	5.8	6.5	7.2	V
		Video	4.0	4.4	4.8	
Vodc	Output bias voltage	Sound	5.2	5.8	6.4	V
		Video	5.0	5.5	6.0	
Vop	Output pedestal		—	5.0	100	mV
Vth	Threshold voltage		2.3	2.5	2.7	V
Gv	Voltage gain	Sound f=1kHz VIN=1Vrms	-0.5	-0.1	—	dB
		Video f=1MHz VIN=0.5Vrms	6.0	7.0	8.0	
THD	Total harmonic distortion	f=1kHz VOUT=1Vms	—	0.01	0.2	%
VN	Output noise voltage	Sound Rg=620Ω BW=15kHz	—	3.0	50	μVrms
		Video Rg=75Ω BW=10MHz	—	0.5	1.0	mVrms
CT	Crosstalk	Sound f=1kHz VIN=1Vrms	80	95	—	dB
		Video f=5MHz VIN=0.5Vms	50	60	—	
Iin	Control input current		-20	-2.0	1.0	μA
ZIN	Input impedance	Sound f=1kHz 20kHz	47	58	—	kΩ
		Video f=100kHz	16	26	—	

SWITCH MODE VERSUS CONTROL INPUT

SW	④ PIN	⑥ PIN
1	GND	GND
2	GND	Vcc
3	Vcc	GND
4	Vcc	Vcc

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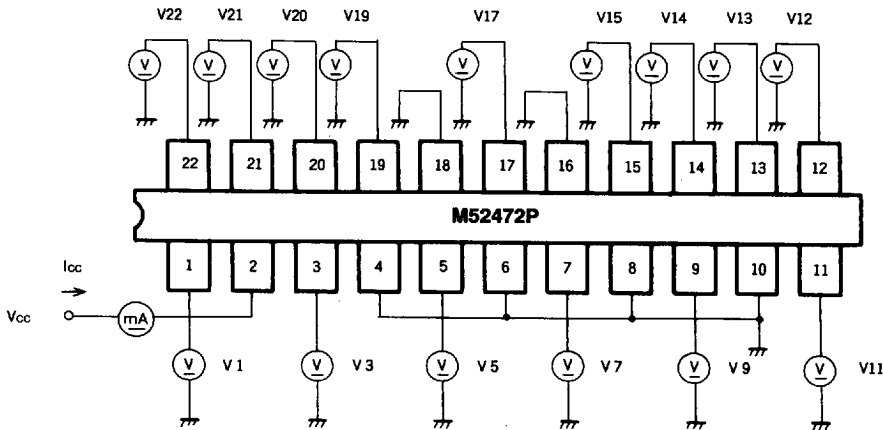
4-INPUT 3-CHANNEL ANALOG SWITCH

TEST CIRCUIT ($T_a=25^{\circ}\text{C}$, $V_{cc}=12\text{V}$, unless otherwise noted)

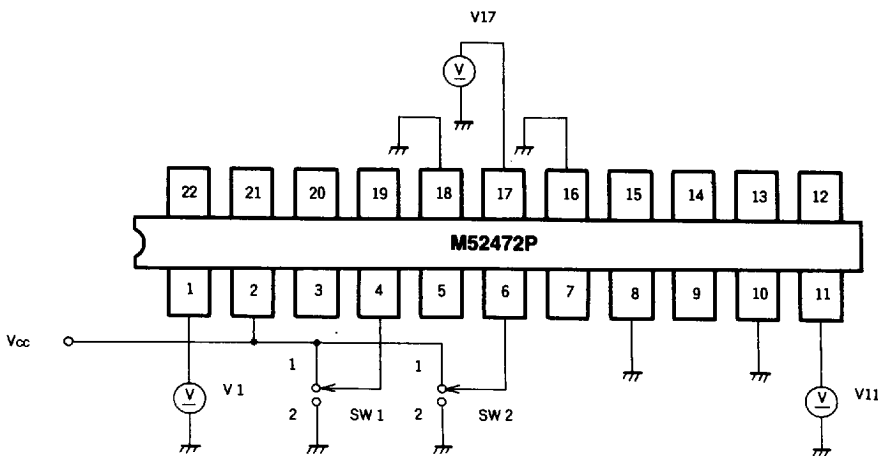
CIRCUIT CURRENT

INPUT BIAS VOLTAGE

OUTPUT BIAS VOLTAGE



OUTPUT DC OFFSET VOLTAGE



For video: Measure DC voltage at V17 when SW2 is turned to 1 and 2 respectively with SW1 turned to 1 and also when SW2 is turned to 1 and 2 respectively with SW1 turned to 2.

For sound: Measure DC voltage at V1 and V11 when SW2 is turned to 1 and 2 respectively with SW1 turned to 1 and also when SW2 is turned to 1 and 2 respectively with SW1 turned to 2.

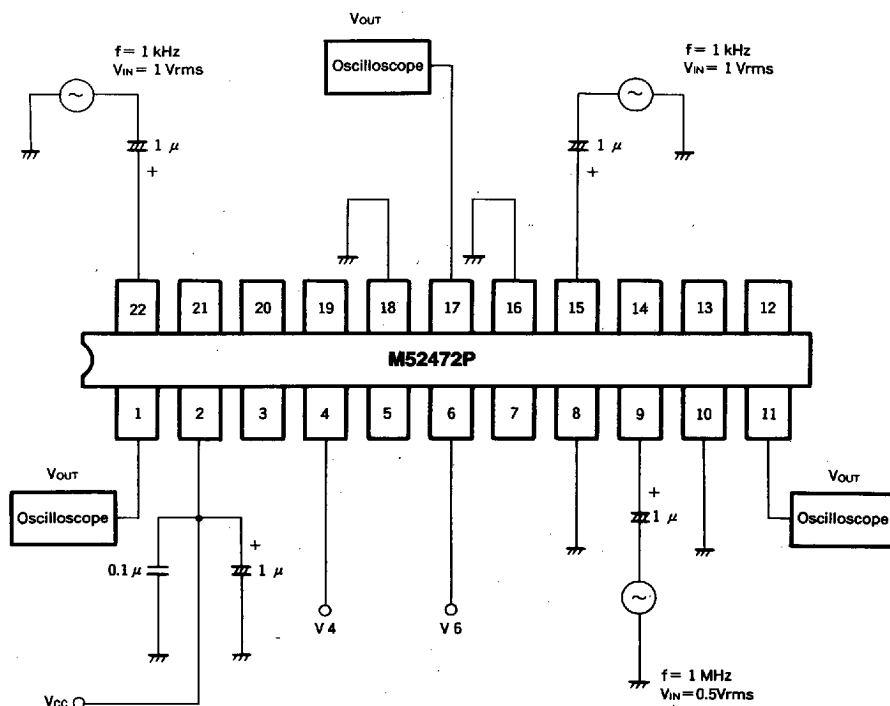
$$V_{OP} = V_{max} - V_{min}$$

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4-INPUT 3-CHANNEL ANALOG SWITCH

CONTROL PIN THRESHOLD VOLTAGE

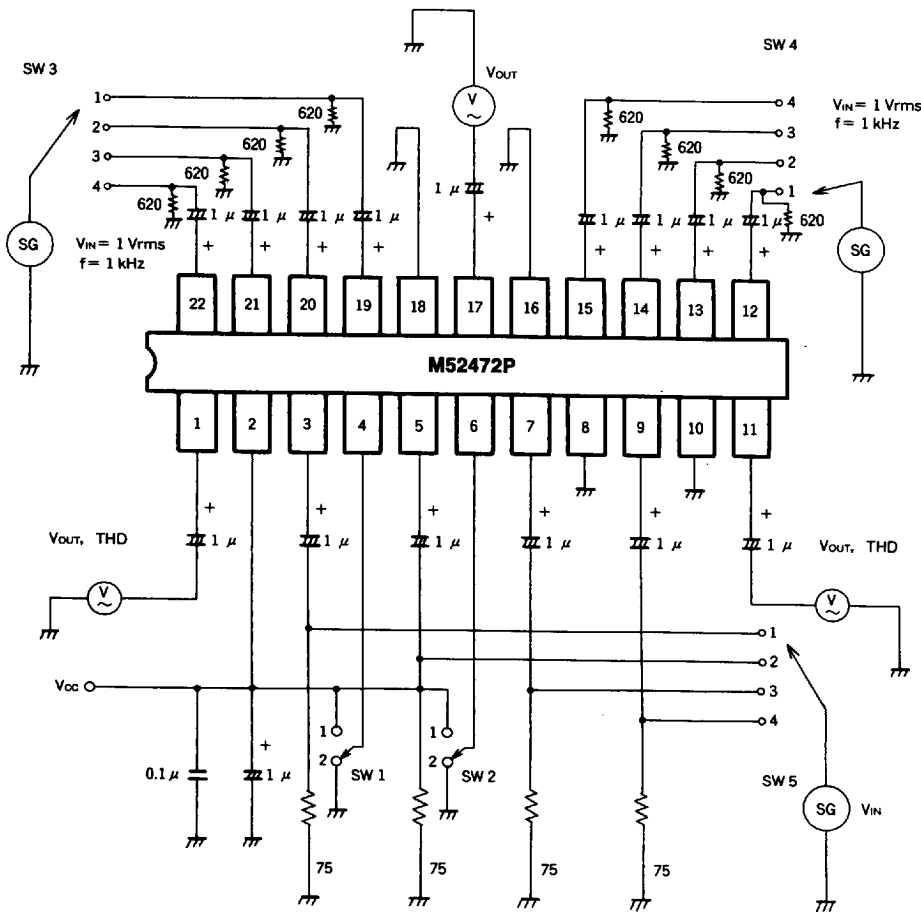


Value of V6 (V4) where DC voltage of V4 (V6) is Vcc, and when the AC element of each output pin switches from OFF to ON while V6 (V4) increases from 1 to 4 [V]

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4-INPUT 3-CHANNEL ANALOG SWITCH

VOLTAGE GAIN, CROSSTALK, TOTAL HARMONIC DISTORTION



Unit Resistance : Ω
Capacitance : F

FOR VIDEO

SW1	SW2	SW5	17PIN
2	2	1	Vos
		2, 3, 4	Voc
2	1	2	Vos
		1, 3, 4	Voc
1	2	3	Vos
		1, 2, 4	Voc
1	1	4	Vos
		1, 2, 3	Voc

FOR SOUND (1)

SW1	SW2	SW3	1PIN
2	2	1	Vos, THD
		2, 3, 4	Voc
2	1	2	Vos, THD
		1, 3, 4	Voc
1	2	3	Vos, THD
		1, 2, 4	Voc
1	1	4	Vos, THD
		1, 2, 3	Voc

FOR SOUND (2)

SW1	SW2	SW4	11PIN
2	2	1	Vos, THD
		2, 3, 4	Voc
2	1	2	Vos, THD
		1, 3, 4	Voc
1	2	3	Vos, THD
		1, 2, 4	Voc
1	1	4	Vos, THD
		1, 2, 3	Voc

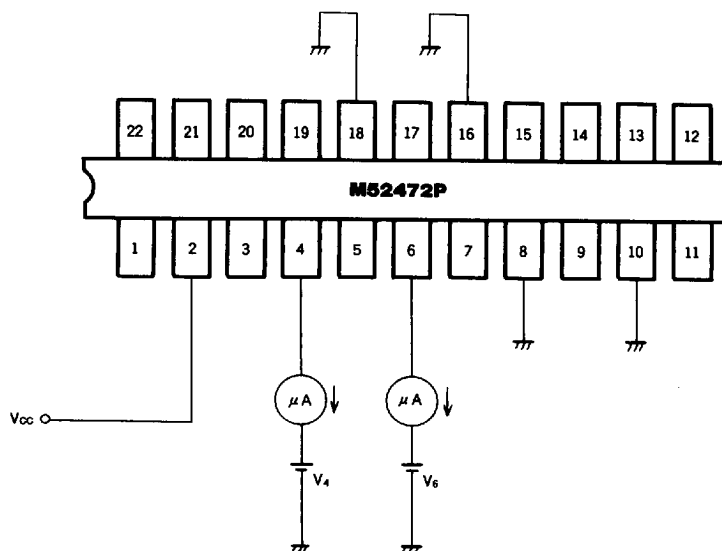
Crosstalk CT=20LOG (Vos/Voc)dB
Voltage gain Gv=20LOG (Vos/VIN)dB

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4-INPUT 3-CHANNEL ANALOG SWITCH

CONTROL PIN INPUT CURRENT



Currents i_{in4} , i_{in6} respectively through pins 4 and 6 when DC voltages V_4 , V_6 (0 to 14 V) are applied.

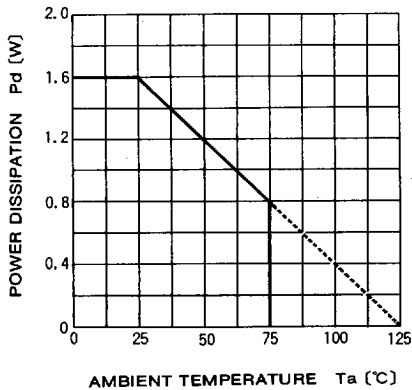
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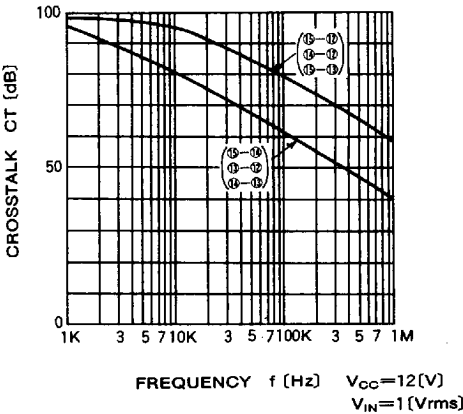
4-INPUT 3-CHANNEL ANALOG SWITCH

TYPICAL CHARACTERISTICS

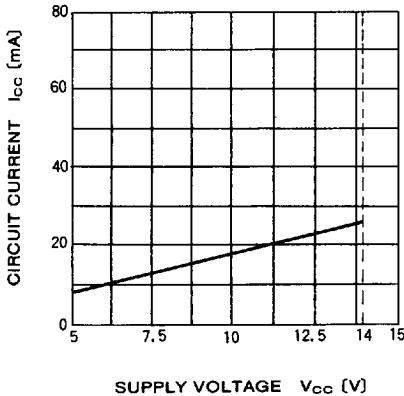
THERMAL DERATING (MAXIMUM RATING)



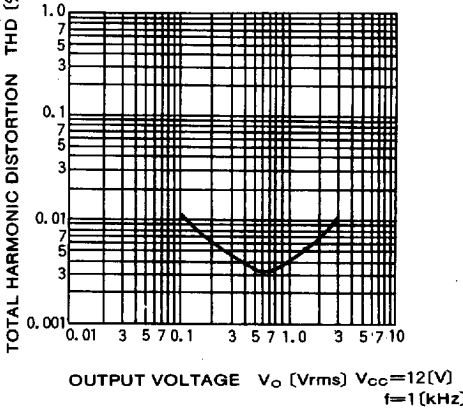
CROSSTALK VS. FREQUENCY (SOUND)



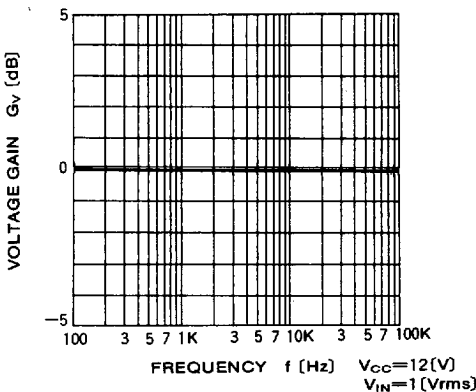
CIRCUIT CURRENT VS. SUPPLY VOLTAGE



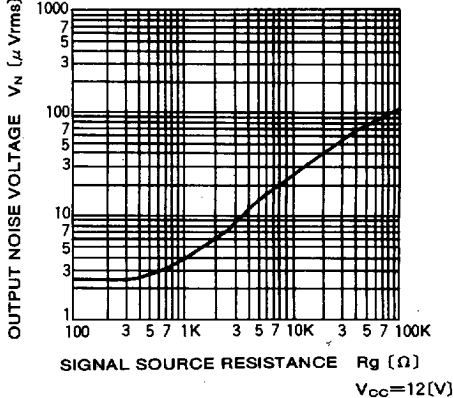
TOTAL HARMONIC DISTORTION VS. OUTPUT VOLTAGE (SOUND)



VOLTAGE GAIN VS. FREQUENCY (SOUND)



OUTPUT NOISE VOLTAGE VS. SIGNAL SOURCE RESISTANCE (SOUND)

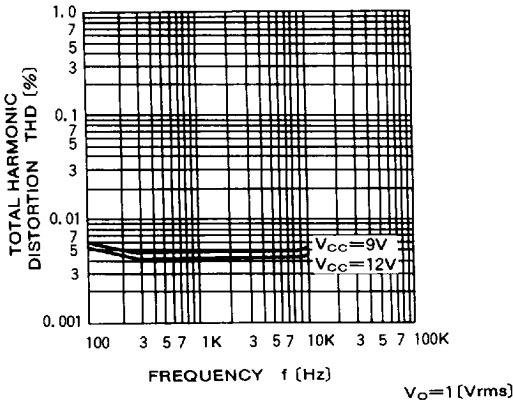


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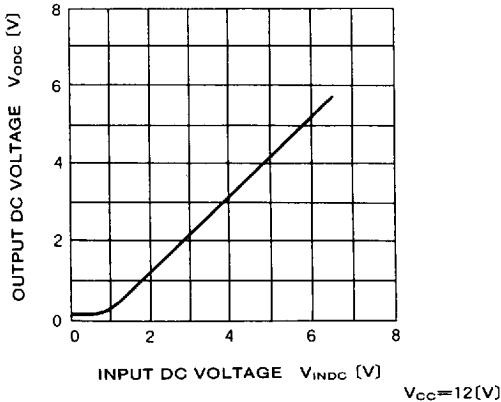


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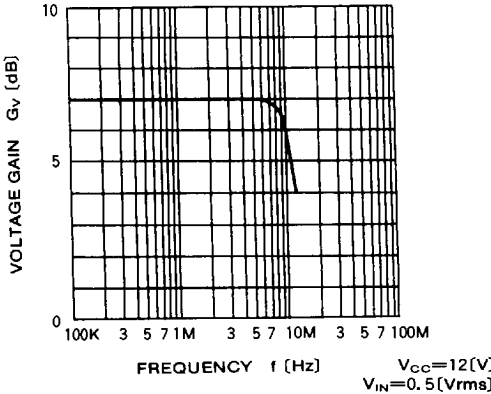
TOTAL HARMONIC DISTORTION VS. FREQUENCY (SOUND)



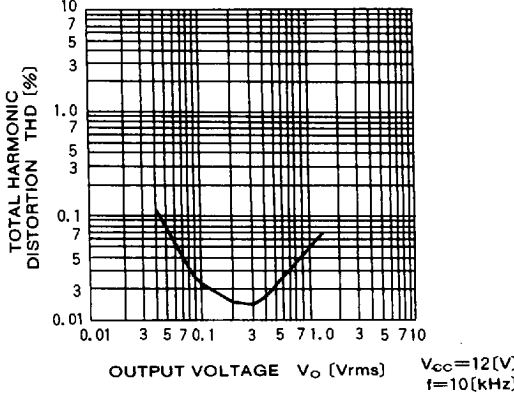
OUTPUT DC VOLTAGE VS. INPUT DC VOLTAGE (SOUND)



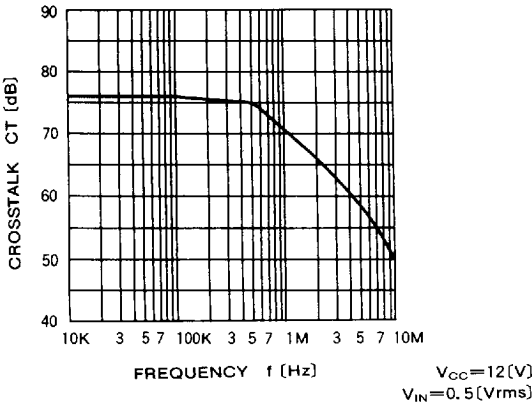
VOLTAGE GAIN VS. FREQUENCY (VIDEO)



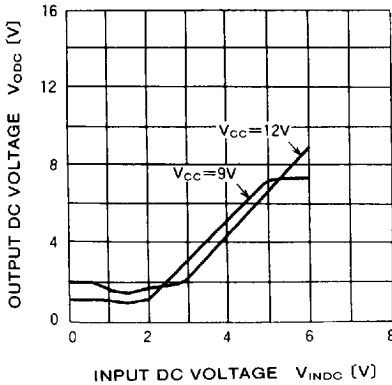
TOTAL HARMONIC DISTORTION VS. OUTPUT VOLTAGE (VIDEO)



CROSSTALK VS. FREQUENCY (VIDEO)



OUTPUT DC VOLTAGE VS. INPUT DC VOLTAGE (VIDEO)

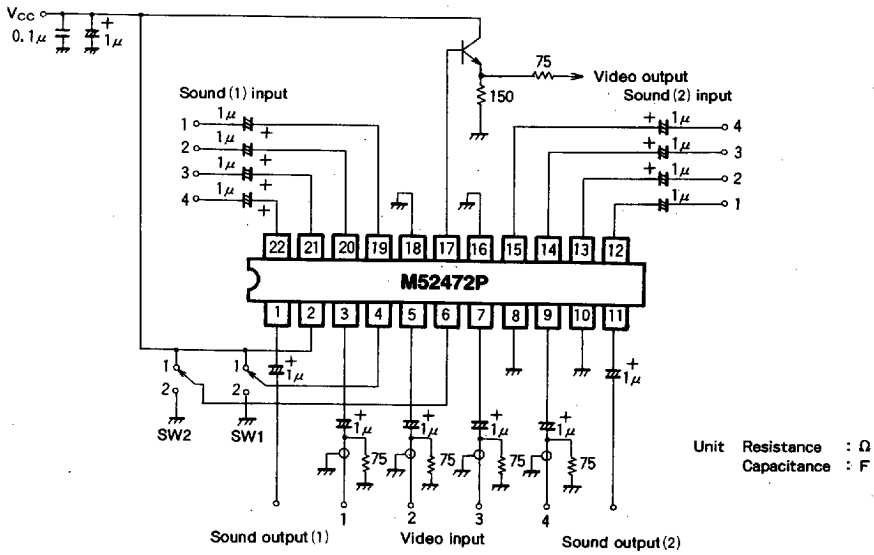


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4-INPUT 3-CHANNEL ANALOG SWITCH

APPLICATION EXAMPLE



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