

# 4-Input Video Switch (no clamp) Monolithic IC MM1053

## Outline

This IC is a 4-input, 1-output video switch developed for use in TV, VCR and other video equipment.

## Features

- 1. Operating power supply voltage range  $V_{CC}=4.75V\sim 13V$
- 2. Frequency response 0.1MHz~10MHz ( $\pm 1.0dB$ )

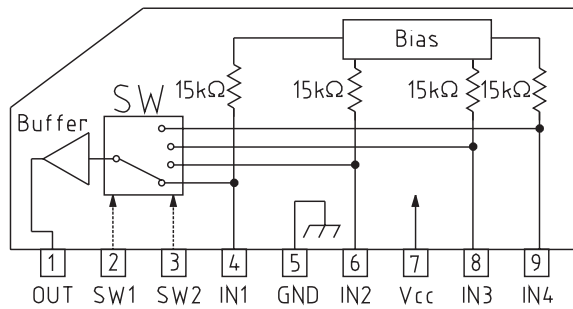
## Package

SIP-9A

## Applications

- 1. TV
- 2. VCR
- 3. Other video equipment

## Block Diagram



Control input truth table

OUT	IN1	IN2	IN3	IN4
SW1	H	L	H	L
SW2	H	H	L	L

Pin Description

Pin no.	Pin name	Function	Internal equivalent circuit diagram
1	OUT	Output	
2	SW1	Switch 1	
3	SW2	Switch 2	
4	IN1	Input 1	
5	GND	Ground	
6	IN2	Input 2	

7	VCC	Power supply	
8	IN3	Input 3	
9	IN4	Input 4	

**Absolute Maximum Ratings** (Ta=25°C)

Item	Symbol	Ratings	Units
Storage temperature	T <sub>STG</sub>	-40~+125	°C
Operating temperature	T <sub>OPR</sub>	-20~+75	°C
Power supply voltage	V <sub>CC</sub>	15	V
Allowable loss	P <sub>d</sub>	470	mW

**Electrical Characteristics** (Except where noted otherwise, Ta=25°C, Vcc=5.0V)

Item	Symbol	Measurement conditions	Measurement conditions	Min.	Typ.	Max.	Units
Operating power supply voltage range	V <sub>CC</sub>	V <sub>CC</sub>		4.75	5.0	13.0	V
Consumption current	I <sub>d</sub>	V <sub>CC</sub>			7.0	11.0	mA
Voltage gain	G <sub>v</sub>	TP3	SG : Sine wave 2V <sub>P-P</sub> , 0.1MHz *1	-0.5	0	0.5	dB
Frequency characteristic	F <sub>c</sub>	TP3	SG : Sine wave 2V <sub>P-P</sub> 10MHz/0.1MHz *1	-1	0	1	dB
Differential gain	DG	TP3	SG : Staircase wave 2V <sub>P-P</sub> , APL=10, 50, 90%		0	3	%
Differential phase	DP	TP3	SG : Staircase wave 2V <sub>P-P</sub> , APL=10, 50, 90%		0	3	deg
Output offset voltage	V <sub>off</sub>	TP2				100	mV
Crosstalk	C <sub>T</sub>	TP3	SG : Sine wave 2V <sub>P-P</sub> , 4.43MHz *2		-65	-55	dB
Switching voltage 1	V <sub>TH1</sub>	TP4	SG : Sine wave 2V <sub>P-P</sub> , 0.1MHz *3	0.7	1.4	2.1	V
Switching voltage 2	V <sub>TH2</sub>	TP5	SG : Sine wave 2V <sub>P-P</sub> , 0.1MHz *3	0.7	1.4	2.1	V
Input impedance	R <sub>i</sub>	TP3			15		kΩ
Output impedance	R <sub>o</sub>	TP3			15		Ω

\*1 Voltage gain G<sub>v</sub>, frequency response F<sub>c</sub>

If input at TP1 for 0.1MHz sine wave input is V<sub>1</sub>, and output at TP3 is V<sub>2</sub>, and output for 10MHz input is V<sub>3</sub>, then :

$$G_v = 20 \text{LOG} \frac{V_2}{V_1}$$

$$F_c = 20 \text{LOG} \frac{V_3}{V_2}$$

\*2 Crosstalk C<sub>T</sub>

If input at TP1 for 4.43MHz sine wave input is V<sub>4</sub>, and output at TP3 is V<sub>5</sub>, then :

$$C_T = 20 \text{LOG} \frac{V_5}{V_4}$$

\*3 Switching voltage V<sub>TH1</sub>, V<sub>TH2</sub>

TP4 level is V<sub>TH1</sub> when TP4 DC level is changed by the external power supply and the output signal switches. TP5 level is V<sub>TH2</sub> when TP5 DC level is changed by the external power supply and the output signal switches.

**Switch Modes**

Item	Symbol	Switch Mode					
		S1	S2	S3	S4	S5	S6
Consumption current	Id	2	2	2	2	3	3
Voltage gain	Gv	1	2	2	2	1	1
		2	1	2	2	3	1
		2	2	1	2	1	3
		2	2	2	1	3	3
Frequency gain	Fc	1	2	2	2	1	1
		2	1	2	2	3	1
		2	2	1	2	1	3
		2	2	2	1	3	3
Differential gain	DG	1	2	2	2	1	1
		2	1	2	2	3	1
		2	2	1	2	1	3
		2	2	2	1	3	3
Differential phase	DP	1	2	2	2	1	1
		2	1	2	2	3	1
		2	2	1	2	1	3
		2	2	2	1	3	3
Output offset voltage	Voff	2	2	2	2	1	1
		2	2	2	2	3	1
		2	2	2	2	1	3
		2	2	2	2	3	3
Crosstalk	CT	2	1	2	2	1	1
		2	2	1	2	1	1
		2	2	2	1	1	1
		2	2	1	2	3	1
		2	2	2	1	3	1
		1	2	2	2	3	1
		2	2	2	1	1	3
		1	2	2	2	1	3
		2	1	2	2	1	3
		1	2	2	2	3	3
		2	1	2	2	3	3
Switching voltage	V <sub>TH1</sub>	1	2	2	2	2	1
	V <sub>TH2</sub>	1	2	2	2	1	2

Measuring Circuit

