2-Input 1-Output 3-Circuit Video Switch

Monolithic IC MM1231~1234

Outline

This is serial 2-input, 1-output, 3-circuit video switch IC for video / audio signal switching with and without clamp circuit.

Circuit configuration tables and block diagrams are as follows.

MM1234 is used as the representative model in this description.

MM1231~MM1234 Series Circuit Configuration Table

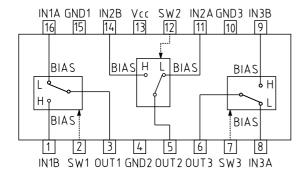
Model name	# of Inputs	# of Outputs	Clamp circuit	Power supply voltage
MM1231	2	1	No	4.6~13.0V
MM1232	2	1	1 input	4.6~13.0V
MM1233	2	1	2 input	4.6~13.0V
MM1234	2	1	3 input	4.6~13.0V

MM1231~MM1234 Input/Output Voltage Measurement Values (typ.)

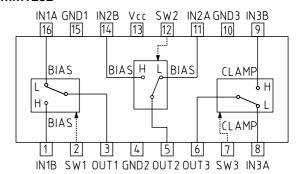
Model name	Input / Output	Pov	Unit		
	voltage	5V	9V	12V	Offic
MM1231	Input voltage	2.80	5.00	6.70	V
IVIIVITZGT	Output voltage	2.01	4.30	6.00	V
	Input voltage	2.80	5.00	6.70	V
MM1232	Output voltage	2.10	4.30	6.00	V
IVIIVI I 232	Input clamp	1.40	2.50	3.30	V
	Output voltage	0.70	2.20	2.90	V
	Input voltage	2.80	5.00	6.70	V
MM1233	Output voltage	2.10	4.30	6.00	V
IVIIVI I 233	Input clamp	1.40	2.50	3.30	V
	Output voltage	0.70	2.20	2.90	V
MM1234	Input clamp	1.40	2.50	3.30	V
	Output voltage	0.70	2.20	2.90	V

Block Diagram (MM1231~MM1234)

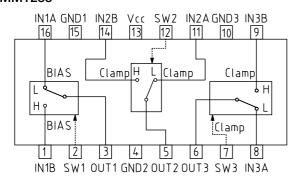
MM1231



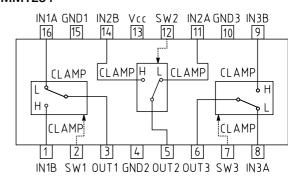
MM1232



MM1233



MM1234



Control input truth table

SW	OUT
	IN1A
L	IN2A
	IN3A
	IN1B
Н	IN2B
	IN3B

Introduction of Main Model

2-Input 1-Output 3-Circuit Video Switch Monolithic IC MM1234

Outline

This is a video switch for video signal switching, with 2-input and 1-output circuits built in. All three circuits have a clamp function.

Features

1. 3 circuits built in, 2-input and 1-output

2. Clamp function

3. Current consumption

4. Operating power supply voltage range

5. Frequency response

6. Crosstalk

9.0mA typ.

4.6~13.0V

10MHz

70dB (at 4.43MHZ)

Package

SOP-16B DIP-16B

Applications

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

Pin Description

Pin no.	Pin name	Function	Internal equivalent circuit diagram
16	IN1A	Input	Vec
1	IN1B		Vcc
11	IN2A		NI \$\frac{220}{\$}
14	IN2B		
8	IN3A		220
9	IN3B		
			/
2	SW1	Switch	SW 10L
12	SW2		SW 10k
7	SW3		405
3	OUT1	Output	Vcc
5	OUT2		\ \frac{\(\tau_{\text{\color}}\)
6	OUT3		46. 48.
			OUT OUT
			± \$ 0 \$
			£\$ 65
			<i>(</i>
13	Vcc	Power supply	
15	GND1	Ground	
4	GND2		
10	GND3		

Absolute Maximum Ratings (Ta=25°C)

Item	Symbol	Ratings	Units
Storage temperature	Tstg	-40~+125	°C
Operating temperature	Topr	-20~+75	°C
Power supply voltage	Vcc	15	V
Allowable less	Pd	350 (SOP-16B)	W
Allowable loss	Pa	1200 (DIP-16B)	mW

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

Item	Symbol	Measurement conditions	Min.	Тур.	Max.	Units
Operating power supply voltage range	Vcc		4.6		13.0	V
Consumption current	Id	Refer to Measuring Circuit		9.0	11.7	mA
Voltage gain	Gv	Refer to Measuring Circuit	-0.5	0	+0.5	dB
Frequency characteristic	Fc	Refer to Measuring Circuit	-1	0	+1	dB
Differential gain	DG	Refer to Measuring Circuit		0	±3	%
Differential phase	DP	Refer to Measuring Circuit		0	±3	deg
Output offset voltage	Voff	Refer to Measuring Circuit			±15	mV
Crosstalk	Ст	Refer to Measuring Circuit		-70	-60	dB
Switch input voltage H	VIH	Refer to Measuring Circuit	2.1			V
Switch input voltage L	VIL	Refer to Measuring Circuit			0.7	V
Output impedance	Ro			25		Ω

Measuring Procedures (Except where noted otherwise, Vcc=5.0V, VC1=Vcc, VC2=0V)

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Item	Symbol	S1	S2	S3	S4	S5	S6	S7	S8	Measuring Procedure
Consumption	Id	2	2	2	2	2	2	2	1	Connect a DC ammeter to the Vcc pin and measure. The
current	Iu									ammeter is shorted for use in subsequent measurements.
		1	2	2	2	2	2	2	1	Input a 2.0V _{P-P} , 100kHz sine wave to SG, and
		2	1	2	2	2	2	1	1	obtain Gv from the following formula given TP1
Voltage gain	GV	2	2	1	2	2	2	2	2	voltage as V1 and TP3 voltage as V2.
ronago gam		2	2	2	1	2	2	1	2	
		2	2	2	2	1	2	2	3	Gv=20LOG (V2/V1) dB
		2	2	2	2	2	1	1	3	, ,
		1	2	2	2	2	2	2	1	For the above Gv measurement, given TP3
_		2	1	2	2	2	2	1	1	voltage for 10MHz as V3, Fc is obtained from
Frequency	Fc	2	2	1	2	2	2	2	2	the following formula.
characteristic		2	2	2	1	2	2	1	2	
		2	2	2	2	1	2	2	3	Fc=20LOG (V3/V2) dB
		2	2	2	2	2	1	1	3	
		1	2	2	2	2	2	2	1	I 4 0 0 1
		2	1	2	2	2	2	1	1	Input a 2.0V _{P-P} staircase wave to SG, and
Differential gain	DG	2	2	1	2	2	2	2	2	measure differential gain at TP3.
		2	2	2	1	2	2	1	2	ADI 10 000/
		2	2	2	2	1	2	2	3	APL=10~90%
		2	2	2	2	2	1	1	3	
	DP	1	2	2	2	2	2	2	1	
		$\frac{2}{2}$	1	2	$\frac{2}{2}$	$\frac{2}{2}$	2	1	1	Proceed as for DC and measure differential
Differential phase			2	1				2	2	Proceed as for DG, and measure differential
		2	2	2	2	1	2	2	3	phase.
		$\frac{2}{2}$	$\frac{2}{2}$	$\frac{2}{2}$	$\frac{2}{2}$	$\frac{1}{2}$	1	1	3	
		$\frac{z}{2}$	2	2	2	2	2	2	1	
		$\frac{2}{2}$	2	2	2	2	2	1	1	
Output offset		$\frac{2}{2}$	2	2	2	2	2	2	2	Measure the DC voltage difference at TP2 for
	Voff	2	2	2	2	2	2	1	2	each switch for VC1 and VC2.
voltage		2	2	2	2	2	2	2	3	cach switch for ver and vez.
		$\frac{2}{2}$	2	2	$\frac{2}{2}$	$\frac{2}{2}$	2	1	3	
		$\frac{2}{1}$	2	2	$\frac{2}{2}$	$\frac{2}{2}$	2	1	1	Assume VC1=2.1V, VC2=0.7V. Input a 2.0V _{P-P} ,
		$\frac{1}{2}$	1	2	2	$\frac{2}{2}$	2	2	1	4.43MHz sine wave to SG, and given TP1
		2	2	1	2	2	2	1	2	voltage as V4 and TP3 voltage as V5, CT is
Crosstalk	Ст	2	2	2	1	2	2	2	2	obtained from the following formula.
		2	2	2	2	1	2	1	3	000mmed 11 0111 0110 10110 1111g 101111111
		$\frac{2}{2}$	2	2	$\frac{2}{2}$	2	1	2	3	C _T =20LOG (V5/V4) dB
Switch input voltage H		$\frac{2}{2}$	2	2	2	$\frac{2}{2}$	2	1	1	Impress an optional DC voltage on TP5 7, 9 and
	VIH	2	2	2	2	2	2	1	2	TP6, 8 and 10. Gradually raise from VC1=0V.
		2	2	2	2	2	2	1	3	TP4 voltage when TP6, 8, 10 voltage is output
		2	2	2	2	2	2	1	1	on TP2 is V _{II} . Gradually lower from VC1=V _{CC} .
Switch input	VIL	2	2	2	2	2	2	1	2	TP4 voltage when TP5, 7, 9 voltage is output on
voltage L	V IL	2	2	2	2	2	2	1	3	TP2 is VII.
								1	J	II D IO TILL

Measuring Circuit

