2-Input 1-Output 3-Circuit Video Switch

Monolithic IC MM1231~1234

November 2, 2001

Outline

These ICs are video switch ICs incorporating three 2-input 1-output circuits for video/audio signal switching. The series includes those with a clamp circuit.

The circuit configuration table and block diagram are shown below.

MM1234 is introduced as a representative model in this document.

MM1231~MM1234 Series Circuit Configuration Table

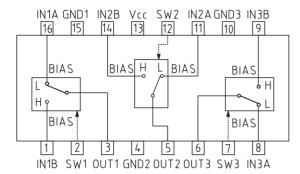
Model name	# of Inputs	# of Outputs	Clamp circuit	Power supply voltage
MM1231	2	1	No	4.6~13.0V
MM1232	2	1	1 input	4,6~13.0V
MM1233	2	1	2 input	4.6~13.0V
MM1234	2	1	3 input	4.6~13.0V

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

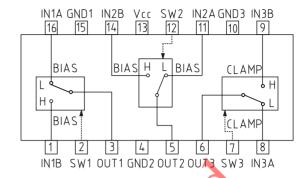
Model name	Input / Output	Pov	Unit			
Wiodel Harrie	voltage	5V	9V	12V	Offic	
MM1231	Input voltage	2.80	5.00	6.70	V	
IVIIVITZOT	Output voltage	2.01	4.30	6.00	V	
	Input voltage	2.80	5.00	6.70	V	
MM1232	Output voltage	2.10	4.30	6.00	V	
IVIIVITZOZ	Input clamp	1.40	2.50	3.30	V	
	Output voltage	0.70	2.20	2.90	V	
<u> </u>	Input voltage	2.80	5.00	6.70	V	
MM1233	Output voltage	2.10	4.30	6.00	V	
IVIIVITZGG	Input clamp	1.40	2.50	3.30	V	
MM1234	Output voltage	0.70	2.20	2.90	V	
	Input clamp	1.40	2.50	3.30	V	
	Output voltage	0.70	2.20	2.90	V	

Block Diagram (MM1231~MM1234)

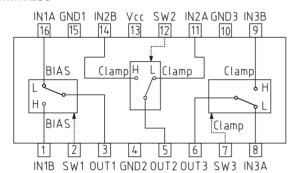
MM1231



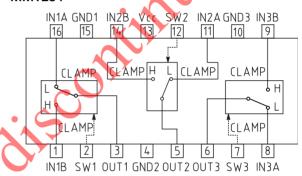
MM1232



MM1233



MM1234



Control input truth table

	SW	OUT
	X	IN1A
	L	IN2A
		IN3A
		IN1B
	Н	IN2B
		IN3B
Rich		

Introduction of Main Model

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

November 10, 1993

Outline

This IC is a video switch IC for video/audio signal switching incorporating three 2-input 1-output video switch circuit. These three circuits includes a clamp function.

Features

- 1. Incorporates three 2-input 1-output video switch circuits
- 2. Clamp function included

3. Current consumption
4. Operating supply voltage range
5. Frequency response
9.0mA typ.
4.6~13.0V
10MHz

6. Crosstalk 70dB (at 4.43MHZ)

Packages

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	\/ss
1	IN1B		Vcc
11	IN2A		NI × 220
14	IN2B		
8	IN3A		220
9	IN3B		
2	SW1	Switch	SW 10b
12	SW2		5W 10k
7	SW3		3
3	OUT1	Output	
5	OUT2		A A VCC
6	OUT3		49.5 74.5 74.5
		XS XO	13.4 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.
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 loss	Pd	350 (SOP-16B)	mW
Allowable loss	ra	1200 (DIP-16B)	111 VV

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

			(
Item	Symbol	Measurement conditions	Min.	Typ.	Max.	Units
Operating power supply voltage range	Vcc		4.6		13.0	V
Consumption current	Id	Refer to Measuring Circuit	Y	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
Riodilicis						

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.
Voltage gain		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
	GV	2	2	1	2	2	2	2	2	voltage as V1 and TP3 voltage as V2.
voitage gain		2	2	2	1	2	2	1	2	voltage as v1 and 11 5 voltage as v2.
		2	2	2	2	1	2	2	3	Gv=20LOG (V2/V1) dB
		2	2	2	2	2	1	1	3	Gv=2020G (v2) v1) ub
		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, Fo is obtained from
Frequency	Fc	2	2	1	2	2	2	2	2	the following formula.
characteristic	10	2	2	2	1	2	2	1	2	are rone wing formation
		2	2	2	2	1	2	2	3	Fc =20LOG (V3/V2) dB
		2	2	2	2	2	1	1	3	1 C-2020 (\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
		1	2	2	2	2	2	2	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.
Directinal gain		2	2	2	1	2	2	1	2	
		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	
		2	1	2	2	2	2	1	1	
Differential phase		2	2	1	2	2	2	2	2	Proceed as for DG, and measure differential
-		2	2	2	1	2	2	1	2	phase.
		2	2	2	2	1	2	2	3	
		$\frac{2}{2}$	2	2	2 2	2	2	2	3	
		$\frac{2}{2}$	2	2	$\frac{2}{2}$	$\frac{2}{2}$	2	1	1	
Output offeet			2	2	2	2	2	2	2	Measure the DC voltage difference at TP2 for
Output offset	Voff	2	2	2	2	$\frac{2}{2}$	2	1	2	each switch for VC1 and VC2.
voltage		$\frac{2}{2}$	$\frac{2}{2}$	2	$\frac{2}{2}$	2	2	2	3	cach switch for ver and vez.
		2	2	2	$\frac{2}{2}$	$\frac{2}{2}$	2	1	3	
		1	2	2	2	2	2	1	1	Assume VC1=2.1V, VC2=0.7V. Input a 2.0V _{P-P} ,
	,	2	1	2	$\frac{2}{2}$	$\frac{2}{2}$	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	
		2	2	2	2	2	1	2	3	C _T =20LOG (V5/V4) dB
		2	2	2	2	2	2	1	1	Impress an optional DC voltage on TP5 7, 9 and
Switch input	VIH	2	2	2	2	2	2	1	2	TP6, 8 and 10. Gradually raise from VC1=0V.
voltage H		2	2	2	2	2	2	1	3	TP4 voltage when TP6, 8, 10 voltage is output
0 :: 1 :		2	2	2	2	2	2	1	1	on TP2 is Vih. Gradually lower from VC1=Vcc.
Switch input voltage L	VIL	2	2	2	2	2	2	1	2	TP4 voltage when TP5, 7, 9 voltage is output on
		2	2	2	2	2	2	1	3	TP2 is VIL.

Measuring Circuit

